Poster Week 17/2022

ABSTRACT BOOK

Escola Superior de Tecnologia da Saúde

Politécnico de Coimbra

May 30th – June 3rd 2022

estesc
Politécnico de Coimbra

SCIENTIFIC COMITEE

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Calendário

Poster Week 17/2022

SCHEDULE

	2ªf		3ªf		4ªf		5ªf	6ªf
	30/mai		31/mai		01/jun		02/jun	03/jun
8-9h								
9-10h			Cristina Santos Gestão da Qualidade da Água II - 6P Saúde Ambiental	Hélder Simões Higiene do Trabalho -1P SA	Ana Baltazar Tecnologia da Alimentação - 9P Dietética e Nutrição			
10-11h	Inês Araújo Meios de Comunicação Não Oral II - 6P Audiologia					Claúdia Reis Audiologia Clinica II - 7P Audiologia		Célia Gomes IAFarm - 1P Farmácia
11-12h		Jorge Balteiro Tecnologia e Farmácia Galénica II - 10P Farmácia	Diana Martins Anatomia Patológica Sistemática - 4P CBL	Rui Cruz Farmacoterapia - 11P Dietética e Nutrição	Cristina Santos Saúde Pública - 6P Saúde Ambiental			Célia Gomes Microbiologia Alimentar - 1P DN
12-13h								
13-14h								
14-15h	Carla Matos Meios Técnicos de Reabilitação Auditiva - 6P Audiologia	Fernandes Mendes - 8P Imunohemoterapia Clínico-Lab. I CBL					Ana Baltazar Toxicologia Alimentar - 9P Dietética e Nutrição	
15-16h								
16-17h	Susana Cardoso Bio. Molecular - 4 Farmácia	Joaquim Pereira Electrocardiologia II - 15P Fisiologia Clínica	Susana Cardoso Biologia Molecular - 6 Farmácia		Paulo Matafome Fisiologia II - 9P Fisioterapia	João Lima Política Nutricional - 11P Dietética e Nutrição		
17-18h	João Lima Nutrição Humana - 10P Dietética e Nutrição							
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A31 – A40	Molecular Biology	Pharmacy
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A56 – A65	Human Nutrition	Dietetics and Nutrition
A66 – A71	Water Quality Management II	Environmental Health
A72	Occupational Hygiene	Environmental Health
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ABSTRACTS

STRATEGIES TO FACILITATE COMMUNICATION WITH THE DEAF

Ana Bastos, Daniela Simões, Daniela Costa, Mariana Ferreira, Mariana Calaixo e Raquel Garcia

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Introduction: At the end of the 20th century, and in a more intense way from this century on, the information and communication technological resources opened new possibilities of communication and access to information for deaf people. The need of communication in health between professional and patient is very important, because an inadequate communication can influence the treatment, cause suffering and unnecessary confusion. With this, it is extremely important to implement strategies to facilitate communication with deaf people.

Objective: To deepen the knowledge about the strategies that facilitate communication with deaf people in hospital care.

Methodology: A systematic review of the literature was conducted, using the search strategy to identify studies assessing safety, efficacy, and subjective outcomes. Through the electronic databases B-On, PubMed, Google Scholar, Web of Science, with the keywords "Communication strategies with deaf people", "Health", " Health professionals", "Communication", "Deafness" in English and Portuguese. Applying exclusion criteria to a temporal period prior to 2010, we obtained a total of 16 articles.

Results: The communication strategies used by health professionals in the care of the deaf community are lip reading, assistance from a companion, writing, sign language and in some cases use of technologies, such as WhatsApp, even during face-to-face care.

Conclusions: Through this study, it was possible to realize the need to implement strategies that facilitate communication in hospital settings between patient and professional, so that they promote autonomy and respect the privacy of the deaf person.

Keywords: "Communication strategies with deaf people", "Health professionals and deafness"; "deafness and communication in health"

FUNDAMENTAL ASPECTS OF THE CHARACTERIZATION OF THE DEAF PERSON

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Introduction: Deaf communities share linguistic and cultural aspects, present in various places around the world, which share experiences and histories in common. This community is supported by symbolic bonds that gather individuals who have equal interests, whether they're in the same place or dispersed territorially. These people belong to a linguistic minority in society that seeks security, comfort, their peers, who share forms of visual communication, in addition to common expectations and projects.

Objective: Through the literature review, we intend to analyze and identify the aspects that characterize deaf people and deepen the knowledge about the deaf community.

Methodology: We carried out a literature review through research to the Web of Science and Google Scholar with the keywords: "deafness", "deaf person", "fundamental characteristics", after applying the exclusion criteria, 10 articles were selected, 5 were rejected because they're not compatible with the purpose of our study.

Results: Although the deaf community is spread over several different cities and countries, cultures and contexts are quite different, they share several affinities, practices and projects in common. With technological advances, global communication between deaf communities is now possible, giving the possibility of strengthening ties between the deaf population, sharing and promoting cultural productions and ideas, even being physically and geographically distant.

Conclusion: It's necessary to know the particularities of the identity and culture of the deaf people, in order to provide the development of communicative skills and favor the relationship between the deaf and the society. Nowadays the deaf community appreciates their differences and values their ability to develop.

Keywords: Deafness; Deaf person; Fundamental characteristics.

DEAF PERSON AND SIGN LANGUAGE

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Introduction: Nowadays many people are still unaware of sign language as a form of communication. Many still call it language and not language, doing so incorrectly. The Sign Language, currently, is an established language, similar to others, with verbal tenses, with a syntactic, morphological and phonological system. As an alternative to the sound barrier, the vast majority of deaf people use sign language as a form of communication, which allows them to better insert into their social environment.
Objective: It is intended to study the importance of sign language in the lives of deaf people.
Methodology: A search was carried out in the Academic Search Complete databases; B-on; PubMed, with the keywords: "Deafness"; "Sign Language"; "Non-oral communication", "Sign Language" obtaining a total of 5 articles for this study.
Results: Although sign language is considered the language of the deaf community, the majority of the hearing population has no knowledge to communicate through this language. In order to bridge this barrier, it would be important to insert SL into school education worldwide.
Conclusion: Sign language, being recognized as a language of the deaf community, allowed greater integration into this community in society, which facilitated the insertion of individuals in various situations, such as access to education, health, employment, among others. However, it would be important to insert SL into school education so that it could be understood by everyone.

Keywords: Deafness; Portuguese Sign Language; Communication; Hearing Impaired.

HISTORY OF THE DEAF IN PORTUGAL AND IN THE WORLD

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Introduction: The in-depth knowledge about the deaf community, about oppressive educational systems, the fights for equality, the search for identity, the recognition of sign language and the cultural development of the deaf lead to the importance of historical evolution, with technological and pedagogical advances of the society over the years.
Objective: Understand the historical evolution of the deaf in Portugal and in the world, as well as the prejudice that they have experienced through time and the barriers that they had to overcome to achieve their rights.
Methodologies: Through a literature search, in SciELO and Google Academic platforms, using the keywords "History of the deaf"; "Sign Language"; "Education of the deaf"; "Evolution of the deaf". Ten articles were selected for this study.
Results: It was possible not only to verify a distinction in the way the deaf were seen in society but also that many times the conquest of rights was not about inclusion but rather a forced adaptation, namely, the implementation of sign language, the installation of schools for the deaf people, marriage, among other achievements.
Conclusion: We conclude that the path of the deaf people was hard. From the lack of strategies for the integration of the deaf community in society as well as the deconstruction of the hearing people ideals to their current role. Knowing the historical and social perspective of the deaf allows us to reflect on the practical educational methods that are most appropriate today, in order to honor and equalize their position in society as citizens.

Keywords: Deaf History; Sign Language; Deaf Education; Deaf Evolution.

THE COCHLEAR IMPLANT CONTROVERSY IN THE DEAF COMMUNITY

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Introduction: Nowadays, there are several alternatives so that children with hearing loss can have the opportunity to learn to communicate, either oral or sign language. Cochlear implant has the objective to stimulate the auditory nerve enabling people with severe to profound deafness to hear. Although the existing technology, is evolved and partially successful, there are still some controversies about this device, mainly coming from the deaf community.
Objective: Understand the acceptance of cochlear implants in the deaf community at present time.
Methods: A review analysis was performed, using the search strategy to identify studies evaluating safety, efficacy, and subjective outcomes. The electronic databases, Google Scholar, Web of Science, in English and Portuguese, were consulted, obtaining a total of 10 articles.
Discussion: The cochlear implant controversy positions hearing parents at odds with deaf parents. They prefer to raise their deaf children in a deaf culture, while hearing parents, who are unfamiliar with the deaf community, prefer implant surgery. Implants cause differences of opinion in the deaf community regarding the hearing society's point of view on deafness.
Conclusion: Not all members of the deaf community agree with cochlear implants. Often, due to the lack of information, the implant decision can be difficult , because many parents have no idea what it means to belong to the listening community or to be in both communities at the same time, therefore having to inform themselves about both points of view, and this choice cannot be made lightly as it changes the whole family dynamic.

Keywords: "Cochlear implant"; "deaf"; "deaf community"; "denial" ;"opposition".

ASPECTS ON THE SOCIALIZATION OF THE DEAF FROM SCHOOL LIFE TO ADULTHOOD

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Introduction: Communication is the basis of society. In a deaf person there are many barriers in communication that compromise the interaction between individuals, since the lack of oral communication makes the deaf disintegrated into the hearing society.

Objective: To address various aspects of the socialization of the deaf from school life to adulthood.

Methodology: An analysis of several articles taken from google academic, using the keywords, deaf socialization difficulties, deafness, integration of the deaf community, deafness in adulthood, deafness in school life and a period between 2008 and 2022. First, we performed an analysis of the titles and abstracts, where 40 articles were chosen. Next, a full analysis of the articles was performed, leading us to 26 final articles.

Results: There is a wide variety of technological equipment that contributes to the socialization of the deaf and their integration. Currently there are several laws and policies for social inclusion, to improve the integration of the deaf both in school and in professional life, however there are still aspects that need significant evolution so that this population has a better quality of life.

Conclusion: When it comes to deafness acquired in adulthood, the main area affected is related to work, since it is here that interacts with a larger number of normal-hearing people since they are the majority of society. Communication difficulties lead to embarrassment in understanding rules, performing routines and obligations, harming the hearing-impaired individual in front of his work or school colleagues.

Keywords: Difficulties of socialization of the deaf, deafness, integration of the deaf community, deaf in adulthood, deaf in school life

FLOCCULATION OF SUSPENDED PARTICLES

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Suspensions are heterogeneous and thermodynamically unstable systems, so the dispersed particles tend to cluster together to form floccules. Very small particles improve the physical stability of suspensions, but are usually more difficult to resuspend. Particles that form aggregates cause the suspension to break down more quickly, but the sediment is easier to disperse. When the dispersed phase of a sedimentary suspension is impossible to disperse homogeneously by agitation, this corresponds to “caking”. The ideal is to obtain suspensions with a controlled tendency to flocculation. The flocculation degree can be assessed by determining the relationship between the height of the sediment and the height of the liquid phase or by electrophoresis. The first method consists of placing the suspension in a beaker and letting it settle until it doesn’t increase the height of the sediment, while the electrophoresis method is based on the determination of the zeta potential, using a microelectrophoresis cell. The problem of suspension stability can be solved by controlling the sedimentation rate, preventing the aggregate material from becoming compact. A flocculating agent is a chemical agent that can be added to the suspension to help the suspended particles stick together. A negative flocculating agent is added to the positively charged particles to be suspended, and only then is the suspending agent included, which will delay flocculation. In the particles with a negative charge, a previous operation is carried out by involving the particles with a positive substance, followed by the addition of the necessary sweeteners and flavoring agents.

Keywords: Flocculation, sediment, suspension, particles

WETTING AGENTS

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When moving towards a pharmaceutical preparation we must always ensure that it is stable, safe and effective. It is essential to master the technique to be used and all the components of the preparation such as the drugs and the excipients, which must be chosen according to the type of preparation, its application and its effect. Suspensions are heterogeneous systems in which the external or continuous phase is liquid or semi-solid and the internal or dispersing phase consists of solid particles insoluble in the medium used. Wetting agents are added to suspensions to aid the wettability of solids that are more hydrophobic, i.e. they are not sufficiently wettable in the dispersant phase and end up floating, joining the external phase. It is important to ensure that the entire solid is wetted evenly so that we can achieve a more homogeneous suspension, facilitating solubility. When we add the outer phase to the inner phase, contact angles are formed, which is the determining factor for how easily the liquid will spread over the solid. If this angle is greater than 90 degrees there is no wettability, if it is equal to 90 degrees there is reduced wettability, and if it is less than 90 degrees there is wettability. Thus, we can see that the smaller the angle formed between the two phases, the greater the wettability of the solids. Wetting agents have the important function of decreasing the contact angle between the solid and liquid phase, thus decreasing the interfacial tension and diffusing rapidly in the interphase.

The most commonly used wetting agents are polysorbates, gums, glycerine and in general O/A emulsifiers.

Keywords: Suspensions; wettability; angle of contact

SOLUBILIZING AGENTS

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Certain solutions have the need to impregnate one or more solutions, which are the corrective agents. One of these agents are solubilisants, substances that become water soluble and can acquire other properties to solubilize. Through the formation of water-soluble molecular complexes, which sometimes solubility turns out to be greater than that of the active principles in them, if they were free.

As for solubilization by tensioactive agents, solubilisants are usually amphiphilic substances, allow tensiotives to accumulate on the surface of a liquid or to be distributed in the interphase of an oil-water system.

Its behavior in the molecule depends on the predominance of polarity and its concentration determining whether solubilization occurs or not. These agents must present an EHL value between 15 and 18. Its use is used to solubilize essential oils, sulfamides, phenobarbital, dyes, etc. In solubilization through these agents can be favored both the absorption of medicinal substances, as can be inhibited, micelization favors the absorption of an active principle.

Solubilization is used in mixtures of water with one or more liquids to prepare solutions whose concentrations exceed their water solubility coefficients.

In a way, solubilizing agents are a type of corrective agent, which have the function of improving the solubility of substances, to become more water soluble, solubilization is the ability of one substance to dissolve in another.

Keywords: Solubilising agents; tensioactive agents; solubilization

THE USE OF DYES IN PHARMACY

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Some pharmaceutical preparations have got some corrective agents that are intended to modify organoleptic properties: color, flavor and aroma. Of these, the dyes will be ddressed.
In order to show the importance of the use of dyes in pharmacy, the advantages of them on galenic preparations will be presented. Therefore, the properties of dyes used in pharmacy, their modus operandi and some of their incompatibilities will be discussed. With this research some conclusions were made: the use of dyes in pharmacy it's added value for adherence to therapy, especially in pediatrics. These can be used as "flags" for preparations that have toxic constituents. It should be noted that the dyes used in pharmaceuticals products must be innocuous, cannot be toxic and cannot have any type of pharmacological action. So it is crucial that the choosed dyes are certificated by the food and drug administration. It is expected that use of dyes in pharmacy will be a better debated theme. That way regulation can be made of standardized coulours that can be used and in what circumstances since there is no standard to be followed these days.

Keywords: Pharmaceutical technology, Corrective Agents, Dyes

OINTMENTS

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There are several formulas that can be used for dermatological purposes, whether cosmetic or therapeutic, which in turn will correspond to different galenic forms, being classified according to their physical nature, into three main groups: liquid, semi-solid and solid. It is in the semi-solids where the ointments fit. The ointments have a soft consistency and are used with the aim of a topical or even general action, also having protective and lubricating purposes. They contain resins in their composition and may also have, sometimes, high amounts of waxes. They are made up of fatty and hydrophobic excipients, such as vaseline and paraffin, as they have the greatest occlusive and emollient capacity. They form an impermeable layer on the skin, hindering the subsequent evaporation of water, which in turn, due to the fatty compounds and their thermo-insulating capacity, produce a revulsive effect due to local vasodilation. They are indicated in cases of very dry dermatoses, in areas of thicker skin, such as the palms of the hands and soles of the feet, elbows and knees. They are also excellent for softening and removing crusts and flakes. They can also be used in the treatment of psoriasis, however they are contraindicated in infected areas and in exuding lesions, because due to their occlusive action they can cause the infection to worsen. However, these preparations are very little used today having only a practically historical meaning.

Keywords: Semi-solids, ointment, resin, wax

SILICONES IN PHARMACY

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Silicones are polymers of siloxanes (polysiloxanes) that are of great interest in the field of pharmacy, they have a very weak surface tension, a property that can serve to prevent foaming in various media. Silicone is the name given to the different types of organosilicon polymers with siloxane (Si-O) units. Their physical and chemical properties lead to an excellent set of characteristics and benefits that result in reduced adhesiveness, greasy or oily feeling, penetrability, skin lubricity, barrier (protection), and spreadability on the skin. In the human body, silicones are tolerated and can be used for innovative methods of treatment in health care. Silicones are widely used as antifoaming agents, elastomers, and water repellents. Within silicones, fluid silicones are widely used as excipients of ointments and non-fluid silicones as stoppers and to cover ampoules and vials with a water-repellent film. Silicone can also be used in the production of other types of pharmaceutical products such as ear plugs and silicone-based gels for scar reduction treatments, for example.

There are several types of silicone with very different properties, and its use is currently of increasing importance, especially in the field of pharmacy and cosmetics.

Keywords: Silicone; excipients; polymer; pharmacy; cosmetics

POLYETHYLENE GLYCOLS

Ângela Afonso; João Simões; Mélanie Afonso

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Polyethylene glycols (PEG), are part of a family of hydrophilic polymers used in pharmaceutical, foods and cosmetics. Consists in a polymer of ethylene oxide and water, of the formula HO.CH2. (CH2.O.CH2) n.CH2OH. PEG can act as excipients, solubilizes, wetting agents, binding agents, viscosity modifiers or pre-polymers. This way, the molecular weight of the PEG can be assigned using a number that varies between 200 and 8000. The ones that correspond 200, 300, 400 and 600 are liquid at ambient temperature and the ones that have heavier molecular weight are solid wax. They are soluble in water and therefore form clear solutions that do not stain clothes. Are also soluble in ethanol, acetone, benzene, chloroform and glycols, and insoluble in polar solvents like petroleum ether. They are less volatile and hygroscopic, and in consequence of that they resist better against decomposition, and stop drug hydrolysis. They are little invaded by fungus and little toxic, toxicity decreases in proportion with the increase of the molecular weight. With the increase of the molecular weight it can be checked, beyond solidification, the viscosity and the melting/density points. The skin tolerate the PEG well, however, they can be hazardous to the deep skin layers, due to the hygroscopic of this compound, and therefore should not be employed in psoriasis, eczema or acne. Commercially, the PEG are designed like Carbowax, Citrol, Estaxa Emulgents N31, Macrogol, Nonex, Pologol and Polymal. PEG 400 is the liquid raw-material more used as a solvent for internal or external use.

Keywords: Polymers; Raw-matter; Molecular Weight; Hygroscopic; Solubles

INJECTABLE ISOTONIZATION

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Injectable preparations can be sterile solutions, suspensions, or emulsions of drug substances in oily, aqueous, or other vehicles that are suitable for this purpose, which are to be administered parenterally. Depending on the vehicle used, these must meet several requirements. Injectable drugs can take the form of definitive (most common) or extemporaneous preparations. When an aqueous liquid is injected into the body, there is usually an osmotic exchange of water between the cells and this liquid. If the injected solution is hypotonic, liquid enters the cells and may rupture, causing irritation and pain. If the solution in question is more concentrated (hypertonic) the phenomenon of plasmolysis occurs with an increase in the volume of injectable liquid and the appearance of edema and necrosis. The latter are used when faster absorption is sought. The need to isotonize the aqueous injectable solution depends on the route of administration the volume of fluid injected and the speed of application. Isotony is a biological property that depends on there being no cellular change while maintaining the initial cell tone. In many cases isosmia does not correspond to isotony, that is, there are isosmotic solutions that behave as if they were not. Electrolyte and non-electrolyte compounds play an important role in controlling the body's water volume by defining the blood osmotic pressure. For the administration of these compounds, it is necessary to calculate their osmolarity so that there are no errors in their dosage.

Keywords: Isotonization, injectables, osmolarity, parenteral route

PYROGENS

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Pyrogens are composed of more than one species varying among themselves in their chemical composition, however, these are always lipopolysaccharides, water-soluble, non-volatile and of high molecular weight derived from microbial metabolism, fungi, living or dead bacteria, thermostable, filterable, and draggable by water vapor. They can be generated by Gram-negative and Gram-positive bacteria, the former being the most dangerous producers of pyrogens. In injectable liquids, pyrogens can form from 4 different sources, these being raw material, vehicle, preparation material, and packaging, and their evaluation can be done by different assays through biological methods by determining hyperthermia, leukocyte variation, and in vitro gelation. The administration of a high volume of solution containing pyrogens can lead to the manifestation of various symptoms such as pain in the lower back and joints, chills, increased body temperature, and leukopenia. Pyrogens are one of the main contaminants in water, and their treatment must first be done with oxidizing agents, and only then can they be purified, or else adsorption can be used, followed by filtration. The raw material used for injectable drugs may contain pyrogens, however, this situation should be avoided by purchasing products that ensure a high degree of purity.

Keywords: Pyrogens, injectables, pyrogenic reactions, pyrogenic composition, pyrogenic trials

PACKAGING OF MEDICINES USING GLASS CONTAINERS

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In the drug packaging, one of the most used materials is glass, being also one of the oldest materials used by the pharmaceutical industry for this purpose. These kind of recipients needs to have in attention a set of technical features in the packaging of medicines, such as the homogeneity, heat resistance, mechanical shock resistance, between others. It is widely used in the packaging of a great variety of medicines, since syrups, ointments, lotions, ear preparations, preparations for ophthalmic use, nasal preparations and injectables. The glass containers also have a lot of benefits, by being a neutral material, for its high lifespan, for its abundancy in nature and the facility in sterilize. However, the disadvantages are very few.

There are 4 types of containers: type I, type II, type III and type IV or NP. The packaging of medicines in glass containers is considered one of the best options, since the main focus and priority is the quality of the final product.

Keywords: Glass; Packaging; Medicines

AURAL REHABILITATION IN CHILDREN WITH TREACHER COLLINS SYNDROME

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Introduction: Treacher Collins Syndrome (TCS), caused by the mutation in *TCOF1* gene affects the anatomy and auditory physiology since this is an autosomal dominant condition that disturbs the embryonic development of the craniofacial complex and the nuclear flow of proteins. Among the main malformations, we will focus on the impact of the auricular deformities, external auditory canal and inner ear deformities that cause a medium degree of hearing loss.

Objective: Based on a literature review we pretend to identify the best functional solutions for hearing (re)habilitation for children with Treacher Collins Syndrome.

Methodologies: The research and information gathering from articles was carried out on various electronic platforms: SciELO; Academic Google; Academic Search Complete; Biomed Central; B-on; Current Contents (ISI); Elsevier and PubMed using as search engines: Treacher Collins Syndrome, Hearing Rehabilitation, Children and Osseointegrated Implants in portuguese and english. Thirteen articles were found, four were excluded because they did not fit the objective of the study, leaving only nine articles for the present work.

Results: Hearing (re)habilitation involves hearing solutions with bone transduction, usually Osseointegrated Implants, initially transcutaneous and later, when the anatomy of the mastoid allows, percutaneous. After adolescence, there is the possibility of aesthetic reconstruction of the ear canal.

Conclusion: The placement of Osseointegrated Implants is the most recommended hearing solution for children with Treacher Collins Syndrome. Hearing (re)habilitation programs should be centered on the child and on the family with the intervention of the interdisciplinary teams to optimize functional, psychological, and morphological results.

Keywords: Treacher Collins Syndrome; Auditory Rehabilitation; Children; Osseointegrated Implants.

IMPORTANCE OF TECHNICAL MEANS OF AURAL REHABILITATION IN CHILD DEVELOPMENT

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Introduction: The Technical Means of Auditory Rehabilitation (MTRA) are a set of methods and techniques used, which facilitate the development and the learning of children with hypoacusis, reducing the impact of hearing problems. These methods will allow the (re)habilitation of hearing capacity in the child and consequently the perception of the sounds that allow the acquisition and development of speech and language.
Objective: It is intended to study the importance of MTRA in the child's development.
Methodology: A search was carried out in the Academic Search Complete databases; B-on; PubMed, between 2011 and 2020 with search engines: "FM Systems", "Hearing Aid Connectivity", "Auditory Rehabilitation", "Early Stimulation", "Child Development". A total of 10 articles were obtained, and 5 were excluded due to incompatibility with the study.
Results: MTRA, in particular, conventional hearing aids, cochlear implants and osteointegrated implants, showed great help and efficacy in the various types and degrees of hearing loss in the child. It is also essential to use listening support systems in this population. Only the early diagnosis of hearing loss with a view to (auditory re)habilitation using MTRA enables the development of the child's linguistic, social and cognitive abilities, attenuating the impact of hearing loss.
Conclusion: MTRA have a great impact on the quality of life of children with hearing loss. Although they are safe and with good results, it is important to continue to invest in the development of your technology.

Keywords: Auditory Rehabilitation, FM Systems; Early stimulation; Child.

THE IMPACT OF COCHLEAR IMPLANTS EVOLUTION IN CHILDREN

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Introduction: Currently, cochlear implantation is considered the best solution to increase the hearing ability and quality of life of its users. Cochlear implants (CI) stimulate the auditory nerve so that speech and sound can be perceived by profoundly deaf people. The ideal age to place a cochlear implant is between 12 and 24 months with severe to profound bilateral sensorineural hearing loss.

Objective: To study the impact that the evolution of cochlear implants has had on children.

Methodology: A review of several articles was conducted between March 20 and April 1 in Google Academic, PubMed, End Note using the keywords, cochlear implant, children (2 to 12 years), evolution of CI, history, language. Only original articles published in the period 2004-2021 were considered, for a total of 30 articles, selected based on title and abstract. After thorough analysis of the articles, 20 were selected for this review.

Results: The technology of cochlear implants has undergone several modifications over the years until reaching today's devices, however there are still several possibilities for innovation and improvement such as the creation of fully implantable cochlear implants, the minimization of trauma caused by implantation and the optical stimulation of nerve fibers.

Conclusion: Hearing loss can cause cognitive delays and cochlear implants are beneficial for children. Bilateral cochlear implants have many advantages over unilateral ones, showing much better language and speech development. Early diagnosis and close long-term follow-up are essential.

Keywords: cochlear implant, children (2 to 12 years), CI evolution

AURAL REHABILITATION WITH MIDDLE EAR IMPLANTATION IN ADULTS

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Introduction: There have been several studies attempting to find new methods for sensorineural hearing rehabilitation in adults. In the case of medium to severe losses in individuals who do not adapt to the conventional hearing aid, due to the existence of exostoses in the external auditory canal, the presence of chronic external otitis or a tendency to cerumen accumulation, middle ear implantation (MEI) is a surgical alternative. The overall goal of MEI is to increase the mechanical vibrations of the ossicular chain or tympanic membrane, therefore producing an amplified signal to the cochlea.

Objective: To analyze the challenges of sensorineural hearing loss rehabilitation with middle ear implant.

Methodology: A systematic literature review was carried out searching for scientific articles in the electronic databases B-On, Google Scholar, with the keywords "auditory rehabilitation", "sensorineural loss" and "middle ear implant". According to the objective of the work, we obtained 20 articles, being selected 16, from 2010 onwards, according to the inclusion criteria.

Results: Rehabilitation with MEI can vary from to person, both in terms of auditory adaptation and surgical recovery. More natural sound quality, the absence of occlusion and distortion are some advantages. On the other hand, there are risks associated with implantation, since normal hearing may not be restored and it takes time to adapt to the sound quality.

Conclusions: To rehabilitate sensorineural hearing loss, MEI is not the first option, therefore we must carefully evaluate the anatomy and physiology of the patient's ear. However, there have been several studies proving the hearing benefits of these implants.

Keywords: "auditory rehabilitation", "sensorineural loss" and "middle ear implant"

TYPES AND EVOLUTION OF EARMOLD

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Introduction: An earmold is a custom-made or domes device that channels the sound reproduced by a hearing aid through the ear canal and has the function of guiding the sound amplified by the hearing aid to the tympanic membrane. Earmolds have undergone major changes over last decades until today.
Objectives: To knowledge of the different types of molds, as well as their history evolution.
Methodology: We carried out literature review through research to the Web of Science, Google Scholar and the library of ESTeSC with the keywords: Hearing molds; History of the earmolds; Types of earmolds; Audiology, after applying the exclusion criteria, 9 articles were selected, rejecting 3 because they are not compatible with the purpose of our study.
Results: Over the years, many types, sizes, and styles of earmolds have been designed to help the person with hearing loss that have evolved from customized molds to pre-made. Nowadays, we have both, the pre-made molds like silicone domes (open, tulip and double closed) or costume made earmolds (skeleton and semi-skeleton, half shell, canal and canal-lock) made of silicone, acrylic, vinyl or polyethylene. With the different types of molds there are some acoustic modifiers like ventings, damping and horn effects.
Conclusion: The evolution and the different types of earmolds have brought a better quality of life to patients. The choice of the earmold depends on the clinical condition, the degree of hearing loss and also the comfort, age, manual dexterity, eyesight, other inherent aspects of the ear anatomy and perception of the patient.

Keywords: Earmolds; History of earmolds; Types of earmolds; Audiology

BRAINSTEM IMPLANTS

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Introduction: Brainstem auditory implant placement consists of surgery to place electrodes on the cochlear nucleus in the brainstem for electrical stimulation. The implant aims to restore hearing function in cases of bilateral injury with auditory nerve section.
Objective: Characterize the benefits of brainstem auditory implantation in different clinical situations.
Methodologies: An observational study was conducted based on information taken from articles found through a search in the "Scielo" database and the "Google Academic" search engine, with keywords "brainstem implants, deafness, surgery".
Results: In the 15 articles found, only 8 articles were selected according to the objective of the work. The main results pointed out in the analyzed studies are: reestablishment of hearing in patients with total hearing loss, the levels of detection and discrimination of sounds similar to those obtained with cochlear implantation by stimulating the nerve regions according to the number of activated electrodes and the auditory implantation of the brainstem brings better results when associated with lip reading because there are individuals who cannot understand speech only with hearing.
Conclusion: Auditory brainstem implantation provides the reestablishment of hearing sensation in subjects not benefited by the use of hearing aids and cochlear implantation. Almost all implanted patients had some benefit in communication.

Keywords: Brainstem implants, deafness, surgery, pathologies

THE IMPACT OF CD59 BLOOD GROUP IN SCIENCE TRANSFUSION

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In 2014, the membrane protein CD59 was acknowledged as a new blood group system. The system received the number 035, and it comprises one antigen so far, which was named CD59. Known as the membrane inhibitor of reactive lysis homologous restriction factor, and membrane attack complex inhibitory factor, is a cell surface glycoprotein that limits the activity of the terminal complement complex C5b-9 therefore it is an inhibitor of the complement system attached by a glycosylphosphatidylinositol (GPI) anchor not only to erythrocytes but also to various other cellular membranes.

The first demonstration of anti-CD59 was in a patient homozygous for a CD59 deficiency, which led to the discovery of this blood group system. This absence is associated with haemolytic anaemia, Paroxysmal Nocturnal Haemoglobinuria (PNH) and autoimmune diseases.

PNH is an acquired clonal hematopoietic stem cell disorder in which mutations in the *phosphatidylinositol glycan class A* gene result in a deficiency of GPI anchor, and thus absence CD59. The lack of complement control results in intravascular and extra-vascular haemolysis and thrombi formation.

CD59 deficiency can be diagnosed by a column agglutination test for the detection of PNH erythrocytes. Flow cytometry and molecular analysis may confirm the diagnosis. The off-label use of the complement inhibitor eculizumab is presently a therapeutic option that needs to be confirmed by additional studies.

Contrastingly, CD59 has become the global research hotspot, due to the importance in the regulation of complement activation becoming an important target for therapeutic antibody exploration and clinical trial.

Keywords: CD59, blood group, deficiency, paroxysmal nocturnal haemoglobinuria, MAC-inhibitory protein, complement system, haemolysis

THE IMPACT OF GERBICH BLOOD GROUP IN SCIENCE TRANSFUSION

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Gerbich blood group consists of eleven antigens, six of high prevalence and five of low prevalence. These antigens are expressed on type I glycoproteins of the membrane, glycophorins C and D (GPC and GPD, respectively), which are encoded by a single gene, *GYPC*, located on the long arm of chromosome 2. GPC and GPD interact with 4.1R protein, which is responsible for maintaining the shape and stability of the erythrocyte membrane. The high prevalence antigens are associated with three phenotypes: YUS, Gerbich and Leach (Ge null phenotype).

Most of the antibodies, as a response to this blood group antigens, are IgG or IgM. Frequently these are developed naturally, however, they can result from pregnancies or blood transfusions.

As for clinical relevance, anti-Ge2 and anti-Ge3 antigens can cause light to moderate blood transfusion reactions, although rare in most cases. Furthermore, anti-Ge3 can cause perinatal hemolytic disease and anti-Ge is associated with several reported cases of autoimmune hemolytic anemia. As for GPC and GPD proteins, their deficiency may lead to hereditary elliptocytosis, but it is uncommon due to the lack of transfusions required by these patients. Negative Gerbich seem to have greater resistance to infections by *Plasmodium falciparum*, responsible for Malaria, since they do not have GPC and GPD (receptors of the virus).

Keywords: Gerbich, antigens, GPC, GPD, Malaria

THE IMPACT OF THE JR BLOOD GROUP SCIENCE TRANSFUSION

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The Junior (JR) blood group system (ISBT 032) consists of one antigen, Jra, which is of high prevalence across the world. The Jra antigen is located on ABCG2 transporter, a multipass membrane glycoprotein, one of the most highly studied ATP-binding cassette (ABC) transporters because of its ability to confer multidrug resistance. (also known as the breast cancer resistance protein, BCRP), which is encoded by the *ABCG2* gene on chromosome 4q22.1. This phenotype mostly results from recessive inheritance of *ABCG2* null alleles caused by frameshift or nonsense mutations.

The rare Jr(a-) phenotype has been found not only in Japanese and other Asian populations, but also in people of northern European ancestry, in Bedouin Arabs, and in one Mexican. Anti-Jra is generally IgG (some are IgG1; some are a mixture of IgG1 and IgG3) and reacts best by the antiglobulin test, especially when ficin- or papain-treated red blood cells are used. This antibody is involved in haemolytic disease of the foetus and new-born (HDFN) and it has also caused transfusion reactions; therefore it carries clinical relevance.

Keywords: JR, antigen, inheritance, HDFN, mutations, prevalence

THE IMPACT OF VEL BLOOD GROUP IN SCIENCE TRANSFUSION

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Vel is a blood group antigen that was proven to depend on the presence of a small integral protein 1 (SMIM1), a protein whose function is still unknown and was newly discovered on the red blood cells (RBC) surface. The absence of Vel antigen in the majority of individuals is due to a 17-base pair deletion in *SMIM1*, which causes the absence of the *protein* at the cell- membrane. A new discovery was related to homozygosity for the c.64_60del in SMIM1 and meant that there was a universal method for screening for Vel- blood donors. It was later shown that the polymorphism in *SMIM1* intron 2, a region responsible for gene transcription, was the explanation for the variability in antigenic strength.

The protease treatment does not affect serological expression, although sensitivity to reducing agents such as 0.2 M dithiothreitol varies. Anti-Vel are often a mixture of IgG and IgM, readily activates complement and has been associated with mild to severe Hemolytic Transfusion Reaction, although Hemolytic Disease of the fetus and newborn is rare.

Keywords: Vel, antigens, polymorphism, *SMIM1*, protease

THE IMPACT OF Lan BLOOD GROUP IN SCIENCE TRANSFUSION

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The International Society of Blood Transfusion attributed the 33rd position to this blood group system, in 2012. The Lan system only has one antigen, known as LAN1, where the Lan (+) phenotype is predominant in most populations (99,9%) while Lan(-) is considered rare. The Lan (-) blood group is transmitted as an autosomal recessive trait. The Lan blood group antigen is carried in the ABCB6 protein (which gene is in chromosome 2q36) and is known for its crucial role in erythropoiesis and detoxification of cells. Lan (-) people do not express *ABCB6* and don't seem to manifest susceptibility to any disease.

Anti-Lan is an immune IgG3 antibody that can activate the complement and its production can be stimulated by blood transfusion and pregnancy. It is known to cause delayed haemolytic transfusion reactions in adults as well as haemolytic disease in foetuses and new-borns. Even though Lan (-) blood donors are rare, it should be given Lan (-) blood to patients with anti-Lan. Also, it has been a reported a case of autoantibodies against Lan (-) antigen.

A patient with mild autoimmune hemolytic anemia (AIHA) with low Lan antigen expression was found to have the sole autoanti-Lan.

We consider this blood group clinically relevant due to Lan (-) ability to cause Haemolytic Reaction Transfusion and new-born haemolytic disease. However, it has a low frequency in most populations not meeting the mandatory screening requirements. Due to its high-titter antibody, Lan(-) patients should be transfused with Lan (-) blood.

Keywords: immunohematology, transfusion, red blood cells, rare blood type, Lan blood group, ABCB6

THE IMPACT OF THE AUGUSTINE BLOOD GROUP IN SCIENCE TRANSFUSION

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The first example of Anti-Ata antigen of the Augustine blood group was found in 1967 in an African woman, they identified an antibody with a new specificity in the serum of Ms. Augustine, when her third child's red blood cells (RBC) gave a positive direct antiglobulin reaction at birth. Her alloantibody reacted with over 6600 blood donors tested at that time, indicating that Ata was a high frequency antigen.

This Ata blood group may be responsible for severe haemolytic transfusion reactions and mild haemolytic disease in neonates.

Ata antibodies are mostly IgG, but IgM can also be present and can directly agglutinate At(a+) RBC. There were two anti-Ata IgGs, one was IgG1, and the other consisted of IgG1, IgG3, and IgG4. Ideally, At(a-) RBC should be selected for transfusion in patients with anti-Ata, although less incompatible red cell units may be suitable for patients with weak examples of the antibody.

In several surveys, one in 16450 African Americans was At(a-). Familiar analyses provided strong evidence that the At(a-) phenotype results from homozygosity for a recessive gene.

Although all research reports that At(a-)- are of African descent with functional *ENT1*, they identified three brothers of European descent who were homozygous for a null mutation in (c.589+1G>C) and thus have the Augustine Phenotype null. These individuals lacking *ENT1* exhibit periarticular and ectopic mineralization, which confirms an important role for *ENT1/SLC29A1* in humans, bone homeostasis, cardioprotection, and drug transport in RBC.

Keywords: Blood group; Augustine; ATA; Antibody; Antigen; Transfusion; Gene; Antiglobulin.

THE IMPACT OF THE RAPH BLOOD GROUP IN SCIENCE TRANSFUSION

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The Raph blood group is the system 025 in the International Society of Blood Transfusion and consists of a single antigen, MER2, found on gene *CD151* which encodes a family of proteins, tetraspanin. This gene is found on chromosome 11p15.5, being more expressed in immatures erythrocytes and has a signal transduction role. When this antigen is highly expressed it activates hepatocyte growth factor, the phosphoinositide-3-kinase (PI3K). It regulates cell to cell contact maintains vascularization and induces cancer progression. Mutations on *CD151* may occur due to the presence of Anti-MER2. Those who have stop codon at *CD151* gene present nephropathies, deafness and β-thalassemia minor.

The antigen MER2 was the first erythrocyte surface antigen to be defined by monoclonal antibodies, reacting with monoclonal antibodies 2F7 and 1D12.2. The presence of phenotype In(Lu) is closely associated with decreased expression of MER2 in erythrocytes. This is an inhibitor gene independently segregated and is responsible by the appearance of a very rare phenotype, Lu(a-,b-). About 8% of white individuals are phenotypically MER2-. It's rare to find antibodies to antigens of this group because most of the population has these antigens.

Its importance in transfusional medicine is limited to only one transfusion reactions hemolytic and there is no information about this antigen causing hemolytic disease of the fetus and newborn.

Keywords: Raph, MER2, *CD151*, antigens,transfusional

THE IMPACT OF THE CROMER BLOOD GROUP IN SCIENCE TRANSFUSION

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The Cromer blood group system is classified by the International Society of Blood Tranfusion (ISBT) at position 21. It is composed of 18 antigens that are located on the glycoprotein Decay Accelerating Factor (DAF or CD55), attached to the erythrocyte membrane by a glycosylphosphatidylinositol (GPI), a product of the *DAF* gene located on chromosome 1q32. *DAF* is thus found in all cells that are in contact with plasma (including blood cells and vascular endothelium), in the gastrointestinal epithelium, urinary tract, and nervous system.

An inherited deficiency in *DAF* can lead to the Inab phenotype (null phenotype) in which the antigens are absent. Complementary red blood cells (RBC) from patients with paroxysmal nocturnal hemoglobinuria are deficient in DAF and other GPI-linked proteins, such as CD59, and do not express the Cromer system antigens.

Antibodies against Cromer antigens can cause accelerated destruction of transfused RBC, however they are rarely found.

Cromer system antibodies are not associated with perinatal hemolytic disease, because the placenta is a rich source of DAF of fetal origin, which absorbs the maternal antibodies.

Keywords: Cromer, antigens, DAF, antibodies, PNH, DHPN.

CK-MB: CLASSIC USES AND RECENT ADVANCES

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Cardiac biomarkers are fundamental for the diagnosis of acute coronary syndromes and myocardial necrosis. CK-MB is an intracellular macromolecule of the myocardial striated muscle, which includes enzymes (formed by two monomers M and B) and contractile proteins. When there is a myocardial injury, the CK-MB is released into the bloodstream.

The aim of this poster is to acknowledge the efficiency of CK-MB in heart diseases prognosis and therapeutic guidance.

We collected data in Google Scholar and PubMed, selecting recent papers.

The CK-MB quantification can be done by spectrophotometry and immunohistochemical methods using monoclonal and polyclonal antibodies. The cardiospecificity of CK-MB can be achieved by CK-MB/total CK. The advantages of using CK-MB are speed, good cost-benefit, early re-infarction detection, and high sensitivity for an accurate diagnosis of myocardial infarction. The disadvantages are loss of specificity in case of skeletal muscle disease or injury, including after surgery and low sensitivity in a recent or late myocardial infarction, after the onset of symptoms.

We accomplish that the Biomarker CK-MB is quite efficient to detect a myocardial necrosis because, after an ischemic event, the detection of CK-MB and troponin is almost simultaneous, but the drop in CK-MB is much faster, as troponin tends to remain elevated for up to 10 days in more extensive injuries. Myoglobin is the earliest but has low specificity.

In recent studies it was found that CK-MB can be also used for detecting myocardial damage in COVID-19 patients with high-risk of mortality. In addition, it can be an efficient preventive biomarker of severe acute pancreatitis and of organ failure.

Keywords: CK-MB; Biomarker; Heart diseases ; COVID-19; severe acute pancreatitis

CALCITONIN IN MEDULLARY THYROID CARCINOMA

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Calcitonin is a hormone consisting of 32 amino acids, secreted predominantly by thyroid C-cells. Its function is to control the amount of calcium circulating in the bloodstream, since it acts at the level of osteoclasts, the cells responsible for bone destruction. It also has minor effects on calcium processing in the renal tubules and intestinal tract. Thus, drugs for the treatment of osteoporosis, Paget's disease, and excess calcium in the blood contain this hormone. Calcitonin values may vary with age, pregnancy, smoking, and with the use of corticosteroids or Omeprazole.
The aim is to analyze the effects of calcitonin in the body and to understand how it helps in the diagnosis of tumor diseases.
The research was conducted by searching for information in digital databases. The descriptors: calcitonin, medullary thyroid carcinoma and tumor biomarker were used.
The evaluation of calcitonin values is important for the detection of medullary thyroid carcinoma, since production is proportional to C cells mass. Medullary thyroid carcinoma can be diagnosed from the detection of elevated basal calcitonin levels in the blood, or after specific stimulation tests. Calcitonin negative MTC is rare and confounds diagnosis and prognostic directions.
Although calcitonin it is an old biomarker, it is still widely used mainly for the diagnosis of medullary thyroid cancer as well as in the evaluation of complex calcium metabolism disorders.

Keywords: Calcitonin, medullary thyroid carcinoma; cancer biomarker

GLYCATED HEMOGLOBIN (HbA1c): FROM CLASSIC TO NEW PERSPECTIVES

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Glycated Hemoglobin (HbA1c) is produced in human red blood cells when glucose reacts with the amino group on a hemoglobin molecule forming a ketoamine. The glucose molecule is attached to one or both N-terminal valines of the β-polypeptide chains of normal adult hemoglobin. An analysis of several scientific papers was carried out in Pubmed ® and Google Scholar®, using keywords such as Glycated Hemoglobin, Glucose, Diabetes and selected a period of the last ten years. Afterwards, seven papers were analyzed.

We intend to understand the HbA1C biomarker and analyze its use in diabetes detection and the new perspectives of application of this classic biomarker.

According to the research, HbA1c is a biomarker that aims to assess blood glucose levels in the last three months. Although it is a good test, it has limitations in pregnant women, due to changes in red blood cells during pregnancy, and is therefore not the best option. Studies are now being carried out on the variation of this marker in the various stages of pregnancy, especially in women with pre-gestational diabetes and its impact on pregnancy outcomes and postpartum.

We can conclude that the HbA1c test is very accurate and is one of the main tests when it comes to analyzing diabetes. There are pros and cons specially in cases of pregnancy but with an understanding of the variations associated with this phase it could become more useful.

Keywords: Glycated Hemoglobin, Diabetes, Pregnancy

THE EGFR BIOMARKER

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The epidermal growth factor receptor (EGFR) includes an extracellular binding domain (N-terminal portion), a transmembrane domain and an intracellular tyrosine kinase domain (C-terminal) and exerts growth factor signaling transduction from the extracellular medium to the cell. We intended to deepen the importance of this biomarker and its mutations and for this purpose we conducted a literature review in databases such as PubMed.

The most frequent mutations in the *EGFR* gene are found in exons 18, 19, 20 and 21 and can be present in smokers and non-smokers, in females and males, and in tumors with adenocarcinoma histology.

Targeted therapies have been approved for EGFR-positive cancers (detected by ddPCR-digital droplet PCR). EGFR inhibitors can block the EGFR signal that leads cells to grow.

The use of small molecule tyrosine kinase (TK) inhibitors associated with immunotherapy has been applied in treatment, namely in patients with NSCLC (non-small cell lung cancer). They have led to improvements in the clinical management of patients with NSCLC but there's still a need to understand better the mechanisms underlying the effectiveness of therapeutic agents.

Keywords: EGFR; Carcinoma, non-small cell lung cancer, ddPCR

ALK (ANAPLASTIC LYMPHOMA KINASE)

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Anaplastic lymphoma kinase (ALK) also known as ALK tyrosine kinase receptor or CD246 is an enzyme that in humans is encoded by the *ALK* gene. The receptor ALK plays a pivotal role in cellular communication and in the normal development and function of the nervous system.
The objective is to explore the research-related literature on the receptor tyrosine kinase ALK, and how this information is important for the monitoring of patients with cancer that is ALK-positive.
The research was conduted on the electronicdatabase of “PubMed”. The keywords used were: “Anaplastic Lymphoma Kinase”; “Neuroblastoma”; “Non-small-cell lung cancer”; “Tyrosine kinase inhibitor”; The most complete papers from the last six years were selected.
A variety of *ALK* gene mutations have been described across a range of tumour types, including point mutations, deletions and rearrangements. A wide variety of ALK fusions, in which the kinase domain of ALK and the amino-terminal portion of various protein partners are fused, occur in cancer, with echinoderm microtubule-associated protein-like 4 (EML4)-ALK being the most prevalent in non-small-cell lung cancer (NSCLC).
The understanding of oncogenic functions of ALK, and rapid development of ALK inhibitors, has substantially improved outcomes for patients with ALK-positive NSCLC. More data about activation and signalling process in these tumoural contexts are needed to further improve the existing and useful potential as an adjuvant to treatment for ALK-positive disease.

Keywords: Anaplastic Lymphoma Kinase; non-small-cell lung cancer; tyrosine kinase inhibitor

TAU PROTEIN – A BIOMARKER IN ALZHEIMER´S AND OTHER CENTRAL NERVOUS SYSTEM DISEASES

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Tau is a microtubule-binding protein that is required for neuronal axon stability. It is usually expressed within neurons and secreted into the brain interstitial fluid, which communicates freely with CSF (cerebrospinal fluid) and, in a more restricted way, with blood via the brain's glymphatic clearing system.

Our objective is to discuss the association of T-tau (total) and P-tau (phosphorylated) concentrations in body fluids with neuropathological changes, imaging findings and clinical features in Alzheimer's disease (AD) and other CNS diseases.

The research was conducted on the electronic databases of "Google Scholar" and "PubMed". The keywords used were: "tau", "cerebrospinal fluid", "biomarker", "Alzheimer's disease". We selected a review published in 2017 and more recent papers to obtain an overview of the evolution of studies.

CSF T-tau and P-tau are markers of AD-type neurodegeneration. Other tauopathies show mostly normal CSF tau protein concentrations, potentially due to release of other tau forms. There are rapid changes in tau metabolism in preclinical Alzheimer´s, which can be detected with the new p- tau assays.

Keywords: Tau protein, P-tau, cerebrospinal fluid, biomarker, Alzheimer's disease

C-REACTIVE PROTEIN (CRP) TO DIAGNOSE INFLAMMATORY CONDITIONS AND CARDIOVASCULAR RISK

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The liver is responsible for the synthesis of proteins circulating in the bloodstream. In stress situations, such as infections or lesions of organs and tissues, the liver increases the production of so-called acute phase proteins. These proteins have anti-inflammatory activity and helps the immune system fight invading agents.

C-Reactive Protein is widely used to assess the possibility of any infection or non-visible inflammatory process. Nevertheless, CRP can also be used to assess the risk of developing cardiovascular disease, since when raised, the higher the risk of this type of disease.

Throughout this study we tried to understand how CRP contributes to the determination and control of inflammatory diseases and to search for the existence of new applications for this protein.

Literature review was conducted between March and April 2022, in the databases “Google Scholar”, “PubMed” – with keywords: “C-Reactive Protein”, “Inflammatory Diseases”, “Inflammatory Biomarkers”, “CRP and cardiovascular disease risk” and “high sensitivity CRP”.

There are several techniques but they have evolved towards new strategies facilitating the application to new contexts. Conventional CRP is useful for monitoring the acute process or reactivating of a chronic inflammatory process and high-sensitivity CRP (hs-CRP) is useful for assessing low-intensity chronic inflammatory states.

Despite being a classic biomarker, it still has potential for application to new situations, namely in monitoring the risk of death from coronary heart disease. It is desirable to clarify gender-specific differences in association with mortality.

Keywords: C-reative protein, inflammation, cardiovascular risk, hs-CRP

BRCA1, *BRCA2* AND BREAST CANCER

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Biomarkers are used in order to diagnose or to identify possible risks of a disease. *BRCA1* and *BRCA2* are tumor suppressor genes that are responsible for repairing DNA and so preserve the stability of the genetic material and are also fundamental in controlling apoptosis. When a mutation occurs in these genes, DNA repair may not be done correctly, leading to genetic changes and, consequently, to the development of tumors. Thus, we focused on the study of this biomarker in breast cancer.

We intend to understand the usefulness of this biomarker in cancer prevention and diagnosis, the incidence of mutations in these genes and possible ways to control disease progression.

To this end, a literature search was conducted in Google Scholar and two scientific papers related to the subject were selected.

In the analyzed articles, the study method was the analysis of various germ lines of breast cancer, in order to determine the percentage of occurrence of mutations and how these genes act in the case of this pathology.

We conclude that the variants of these genes present different genetic and clinical characteristics depending on the presence or absence of biallelic inactivation. Regular testing for this mutation is necessary, as it is a cause with a high impact of the onset of breast cancer.

Keywords: *BRCA1*, *BRCA2*, biomarker, breast cancer.

KRAS MUTATION IN CELL-FREE DNA OF PACIENTS WITH PANCREATIC DUCTAL ADENOCARCINOMA

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In recent decades there has been an increase in the number of cases of pancreatic cancer, which is highly lethal. cf DNA (cell-free DNA) are fragments that are found outside the cells and may be products of tumour cell activity. These fragments can be used in the diagnosis and monitoring of pancreatic ductal adenocarcinoma (PDAC).

The aim of this study was to understand the principles of quantitative analysis of kras multiplex mutations in cell-free DNA from PDAC patients.

We conducted a research in PubMed database and selected several recent scientific papers.

KRAS is one of the most common oncogenes mutated in PDAC. The most frequent *KRAS* mutations occur at code 12, and among these the most frequent are G12D, G12V and G12R.

The usual determination method is the extraction of cf DNA from plasma and genomic DNA from primary tissues and the testing of KRAS mutations by multiplex ddPCR (droplet digital PCR).

The detection of these mutations are significant factors and when combined with the cancer biomarker CA19-9, have shown additive benefits for predicting overall survival.

Multiplex test of *KRAS* mutations in plasma cf DNA is clinically relevant, providing a potential candidate biomarker for PDAC prognosis.

Keywords: Pancreatic ductal adenocarcinoma, mutation, *KRAS*, cell-free DNA, ddPCR

HER2: CANCER BIOMARKER

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We can consider as a biomarker any substance that can be used to define the stage of a disease or other physiological condition. With this analysis, it is possible to know, for example, cancer progression.

We intend to understand the types and function of the HER2 biomarker. We searched the PubMed database and, selected the most recent advances. So, we analysed papers published in 2020 and2021.

Human epidermal growth factor receptor 2 (*HER2*) is a protooncogene that encodes the epidermal growth factor receptor with tyrosine kinase activity, located on chromosome17. *HER2* can be designated as positive or negative and is determined by IHC tests (immunohistochemistry). A score of 0 to 3+ corresponds to increasing amounts of protein. Cases with *HER2* IHC 3+ are considered positive, so they are usually treated with drugs that target the HER2 protein, and those with an IHC 0 or 1+ are considered negative, not responding to drugs that target the protein.

HER2 mutations are potent oncogenic drivers, that is, they inhibit apoptosis leading to *HER2* amplification, so the activity of this receptor has been shown to amplify the process of cancer formation.

The HER2 immunohistochemistry test is performed on newly diagnosed cancers, being an excellent predictor of the disease progression and with importance for the treatment of the pathology.

Keywords: HER2, targeted therapy, mutations, amplification, cancer

BRUGADA SYNDROME

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Brugada syndrome is characterized by an inherited disorder of cardiac electrophysiology that leads to an increased risk of ventricular fibrillation that can cause sudden death from cardiac arrest and syncope, all in a structurally normal heart.
The prevalence of this syndrome varies according to the regions of the globe and ethnicities, being prevalent in men between 40/45 years old (age of diagnosis).
Regarding its pathophysiology, several genes associated with the disease were identified, with *SCN5A* being the most prevalent.
The diagnosis is based on electrocardiographic features such as a concave ST segment followed by inverted T waves in leads V1 to V3. These features can be observed spontaneously or during a sodium channel blocker test. Two-thirds of people with Brugada syndrome are asymptomatic.
The treatment most used today is the implantation of a cardioverter defibrillator.

Keywords: Brugada syndrome, Inherited Arrythimia, Sudden Cardiac Death.

WPW SYNDROME

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Wolff-Parkinson-White Syndrome is a congenital disease characterized by the presence of an accessory auriculo-ventricular conduction pathway. The accessory pathway allows a bypass to occur to the atrial-ventricular node, which causes a premature ventricular activation

Most patients remain asymptomatic, and the symptoms, when present, are due to tachyarrhythmias, being the most common the paroxysmal supraventricular tachycardia, atrial fibrillation and ventricular fibrillation. The risk of sudden death in this disease is slightly increased by ventricular fibrillation caused by atrial fibrillation.

The classic electrocardiographic pattern of this syndrome is characterized by short PR interval <0.12 seconds, slow progression of the initial segment of the QRS complex, known as delta wave, widened QRS complex >0.12 seconds and secondary repolarization changes.

The most commonly used treatments for this pathology are catheter ablation with radiofrequency and pharmacological therapies.

The numerous diagnostic and therapeutic developments achieved contribute to the cure of the vast majority of patients, who can enjoy a good long-term prognosis.

Keywords: Wolff-Parkinson-White Syndrome, Pre-excitation, Sudden Death.

ATRIAL FIBRILLATION - HEART RATE VERSUS RYTHM

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Atrial Fibrillation (AF) is the most common chronic arrhythmia in which age is the main factor for its development. Approximately 10% of individuals 80 years and above suffer from this disease. In most cases, patients who become symptomatic abruptly experience episodes of palpitations, dyspnea and fatigue.

In this type of arrhythmia, an irregular electrical activity develops caused by hemodynamic and electrophysiological changes that induce an abnormal contraction of the atria (loss of contractility). As a result, the heart does not pump blood efficiently, leading to thrombus formation. This factor makes AF one of the main causes of stroke.

The 12-lead electrocardiogram plays a key role in confirming the diagnosis of AF. It is characterized by the absence of P waves and irregular f waves.

Arrhythmias are treated depending on its type and the presence of other cardiovascular diseases. The main treatments for AF include the administration of drugs with anticoagulant functions, heart rate control, and restoration of sinus rhythm. In more advanced cases, there is still the possibility of performing minimally invasive procedures to correct electrical changes.

Keywords: Atrial Fibrillation, Age, f waves, Heart Rate, Sinus Rhythm.

MYOCARDIOPATHY TAKOTSUBO

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Takotsubo cardiomyopathy also known as broken-heart syndrome is a weakening of the left ventricle, the heart's main pumping chamber; usually as the result of several emotional or physical stress, triggering changes in heart muscle cells or coronary blood vessels (or both) that prevent the left ventricle from contracting effectively, it mimics an Acute Coronary Syndrome (ACS) because of the clinical and electrocardiographic similarities, only being able to diagnose as Takotsubo Syndrome after an hemodynamic study. Affecting mostly postmenopausal women, although it also can affect younger groups and males.

The main situations associated with this diagnose is the increase of stress hormones, like suffering from an emotional or physical stress, such as a sudden illness, the loss of a loved one or a serious accident.

The main symptoms are chest pain and shortness of breath.

Keywords: Takotsubo Syndrome, Left Ventricular Dysfunction, Acute Coronary Syndrome.

VASOVAGAL SYNDROME AND TILT TEST

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Syncope can be described as a transitory loss of consciousness due to cerebral hypoperfusion and is characterized by a rapid onset, short duration, and complete spontaneous recovery.
Vasovagal Syncope occurs when a part of the nervous system suddenly decreases blood pressure and heart rate, leading to decreased cerebral perfusion, and consequently, the occurrence of a fainting spell.
The diagnosis of syncope is still challenging, being the Vasovagal Syncope the most prevalent, especially in young women, being associated with a benign prognosis in terms of mortality.
However, there are patients who have recurrent episodes with great repercussions on their quality of life.
Tests such as holter or electrocardiogram are not the first-line tests to make the diagnosis, but they help to exclude other "non-syncopal" conditions. However, the orthostatic tilt test (Tilt Test) is a very important test in the final evaluation of neurocardiogenic syncope and is considered the "gold standard" technique.

Keywords: Syncope, Vasovagal Syncope, Tilt Test, Neurocardiogenic Syncope.

HYPERTENSION IN PREGNANCY

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Blood pressure refers to the pressure that the blood exerts on the wall of the arteries that are under tension, stretched by the blood pressure. Normal blood pressure is between 120 (systolic) and 80 (diastolic) mmHg. If these increase, we are speaking of hypertension.
Hypertension in pregnancy (140/90 mmHg) is more usual after 20 weeks of gestation and can occur in different degrees: chronic or pre-existent hypertension, gestational hypertension, eclampsia, pre-eclampsia superimposed on chronic hypertension and pre-eclampsia, where our clinical case will be focused. Preeclampsia is a new diagnosis of hypertension or worsening of preexisting hypertension, which is accompanied by an excess of protein in the urine and appears after the 20th week of gestation, a serious complication that can cause preterm birth if not treated properly. Risk factors that contribute to an increase in blood pressure are, the pregnant woman being over 35 years old, being pregnant for the first time, diseases such as obesity and/or diabetes, unbalanced diet.
To prevent hypertension in pregnancy, the woman should: avoid exertion, drink a moderate amount of water, exercise, eat a careful and balanced diet, with little salt and fried food, but which guarantees the intake of vitamins and calcium, and avoid drinking coffee, alcohol, or smoking. Many of the drugs commonly used in the treatment of hypertension are contraindicated in pregnancy, which makes the control of blood pressure a complicated task. As an abnormal reduction in blood pressure occurs, it leads to a severe reduction in blood flow to the placenta, bringing harm to the fetus.

Keywords: Hypertension, Pregnancy, Pre-eclampsia, Blood Pressure.

CORONARY DISEASE IN WOMEN

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Among the family of cardiovascular diseases, coronary disease is the wordlwide leading cause of death in men and women. In Europe, more than a half of female deaths are due to cardiovascular disease.

Coronary artery disease is characterized by the accumulation of fat deposits in the cells lining the wall of a coronary artery and, consequently, obstruct the passage of blood, atherosclerosis. Obstruction may develop an ischemia (inadequate blood supply - hypoperfusion).

The main complications of this disease are chest pain, and myocardial infarction. Although the disease exists in both genders, women are "protected" against cardiovascular disease during childbearing age, due to the possible role of hormones, which is in agreement with the prevalence of coronary artery disease is approximately half of that in men (at "tender" ages). The female gender, when presenting clinically with coronary disease, usually has a smaller number of vessels with significant obstructions than men.

Most available stress-tests methods find pathology more easily, the more vessels are compromised. However, despite an adequate use of complementary methods available, there is a higher incidence of false-positive in stress tests in women when compared to men.

Keywords: Coronary Disease, Ischemia, Women.

ATRIAL FIBRILLATION AND STROKE

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Atrial fibrillation is one of the most prevalent arrhythmias in the general population, constituting an important risk factor for strokes. Around 15 to 30% of ischemic strokes are triggered by an embolism of cardiac origin, with atrial fibrillation standing out among several pathologies that can lead to the development of a cardioembolic event. In this document we will study and analyze the case of a patient that suffered an ischemic stroke whose underlying pathology was an atrial fibrillation. The objective of this work is to analyze the relationship between these two conditions, their characterization and as their determinants.

The patient in question was a 54 years old woman who had visited an outpatient clinic for recurring palpitations. A 12-lead electrocardiogram was performed on her showing atrial fibrillation with rapid ventricular response. Furthermore, although there was no risk factors for thromboembolism, a two-dimensional echocardiography exhibited findings typical of hypertrophic cardiomyopathy. With that in mind, she received amiodarone, a beta-blocker, and aspirin. After six months passed, the patient developed sudden hemiplegia and brain magnetic resonance imaging revealed multiple embolic infarctions in the territory of the middle cerebral artery.

Following conservative treatment and rehabilitation, the patient was able to recover without sequelae and anticoagulation therapy with the use of warfarin was continued thereafter.

Keywords: Atrial fibrillation; Stroke; Electrocardiogram; Magnetic Resonance Imaging.

VENTRICULAR FIBRILLATION

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In this work we will address the topic Ventricular fibrillation which has been defined as turbulent cardiac activity, which implies a huge irregularity in the electrical waves behind ventricular excitation. The process is normally initiated by a rapid formation of a re-entry impeller. We will develop aspects of this subject such as your ECG, ECG findings, pathophysiology, symptoms and therapy. Its etiology is usually associated with problems in the electrical impulses of the heart due to a heart attack or in the heart. Various related causes such as cardiac, respiratory causes such as tension pneumothorax and embolism, there are toxic or metabolic, environmental and neurological causes. The diagnostic oogram is changed as mainly of irregular electrocardiographic moments, inflexible and frequent QR complexes between the 15 waves and the 550 waves finding the amplitude tends to decrease with time. The most recurrent symptomatology of consciousness and if it is not treated for 5 minutes to present brief seizures and loss of responsiveness, after the occurrence of irreversible response problems. The level of therapy or emergency treatment consists of cardiac resuscitation and the use of a defibrillator, after which the doctor may prescribe antiarrhythmic drugs and recommend the use of an implantable defibrillator. We will also present a clinical case of a 7-year-old boy with the same pathology and an analysis of his electrocardiogram.

Keywords: Ventricular Fibrillation, Electrical Impulses, Heart.

HYPERTENSION IN ADOLESCENTS

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Hypertension is considered a global public health problem, characterized by sustained elevation of resting systolic (≥ 130 mmHg) or diastolic (≥ 80 mmHg) blood pressure or both, leading to the risk of cardiovascular complications, causing 9.4 million deaths each year worldwide.

While there is a distinction between primary and secondary hypertension, these are more common in adolescence and preadolescence respectively, due to risk factors including obesity and a family history of hypertension. Furthermore, young people who manifest high blood pressure levels tend to maintain this condition as adults.

Several studies show that target organ damage is frequently present in the child with hypertension and in the young adult, including increased atherosclerosis, carotid intimal thickening, left ventricular hypertrophy, proteinuria, and moderate alteration of cognitive function. As in the clinical case to be presented here, in which a young man presents with primary aortic arteritis of abdominal location, with involvement of the middle portion of the aorta, occlusion of the abdominal aorta with bilateral renal stenosis, relating to levels of hypertension.

Treatment includes lifestyle modification and administration of diuretics, beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, ARBs and calcium channel blockers.

Keywords: Hypertension, Adolescence, Risk Factors.

ARRHYTHMOGENIC DYSPLASIA OF THE RIGHT VENTRICLE

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Arrhythmogenic dysplasia of the right ventricle is a hereditary pathology caused by mutations of the genes of the desmosomas where myocardial replacement occurs by fibrous or adipose tissue in the right ventricle. Thus, there is some difficulty in the passage of the electrical stimulus in the affected region, generating fibrosis that eventually leads to the appearance of arrhythmias.
This disease based on the cardiac muscle is clinically characterized by potentially fatal ventricular arrhythmias. It is a rare disease, however it has a great impact on prognosis, being an important cause of sudden death in young people, namely young athletes. Its diagnosis can be performed taking into account the analysis of structural and functional alterations of the right ventricle, electrocardiographic alterations, analyzing basal ECG conduction, as well as analyzing family history. Here we describe a case of an adult who had palpitations on exertion and suspected arrhythmogenic dysplasia of the right ventricle. After his routine electrocardiogram, he presented a T-wave inversion and possible epsilon waves in right precordial leads. Subsequent investigation showed myocardial fat infiltration in the right ventricle on the MRI, thus confirming the presence of arrhythmotogenic dysplasia of the right ventricle. It was possible to provide correct diagnosis and management, avoiding the potentially lethal consequences. It is therefore very important to make a correct analysis of the electrocardiogram and know how to recognize the factors that lead us to this pathology and also know when to proceed with additional investigations and implementation of therapies.

Keywords: Electrocardiogram, Patology, Arrhythmias, Dysplasia.

HYPERTENSION AND THE RENIN ANGIOTENSIN ALDOSTERONE SYSTEM

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Hypertension is characterized by excessive blood pressure in the wall of the arteries, above the values considered normal, which occurs chronically. Arterial hypertension is defined when the maximum pressure (systolic) is greater than or equal to 140 mmHg, or the minimum pressure (diastolic) is greater than or equal to 90 mmHg.

It may increase in some moments due to physical or emotional efforts, and it is natural that, after these situations, their values return to normal levels.

The Renin Angiotensin Aldosterone System is a neuroendocrine complex system that regulates the modulation of salt and water homeostasis, and regulation of blood pressure. Through its multiple interactions it protects the endothelium, heart, brain and kidney. In addition, the RAAS regulates the vascular response to injury and inflammation. Chronic activation of the RAAS leads to hypertension and perpetuates a cascade of proinflammatory, prothrombotic and atherogenic effects associated with endorgan damage.

Keywords: Hypertension, Renin Angiotesin Aldosterone System.

SUDDEN CARDIAC DEATH IN SPORT

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Sports practice is known to increase longevity and improve quality of life. Sudden death associated with sport has a negative impact on society.

Sudden death in sport is an event that usually occurs associated with heart disease, during physical activity or immediately after it. It is usually associated, in young people, with hereditary diseases - cardiomyopathies and channelopathies -, while in people over 35 years the main cause is atherosclerosis. It is also common in athletes to result from the use of doping or the practice of exercise in extreme environmental conditions.

The mandatory sports assessment includes a thorough clinical history and physical examination and an ECG, which has been shown to be clearly insufficient. If some top-level athletes have access to multidisciplinary assessments, most athletes do not. Prevention in asymptomatic athletes, essentially veterans, is based on the most detailed and specialized pre-competitive evaluation with cardiovascular risk stratification, exercise test, holter and clinical or other analyzes, if necessary. Athletes with symptoms are subject to more specific and in-depth assessments.

The main complaints to be investigated are chest pain, palpitations, syncope and exaggerated tiredness, however in most cases there are no previous complaints and the tests performed are normal, so, in addition to the pre-competition assessment, the prevention of sudden death in sport also involves performance of physical exercise in places with the presence of emergency material with defibrillation capacity (DAE).

Keywords: Sudden death, Heart Disease, Sport, Atherosclerosis.

POLYMORPHIC VENTRICULAR TACHYCARDIA

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Polymorphic Ventricular Tachycardia is an arrythmia highly lethal. It's considered an arrythmia when there are at least 3 ventricular consecutive beats with a heart rate higher than 120 bpm. It's also considered polymorphic because there are several focuses or different ways which makes the QRS complexes variable and irregular, usually 1 QRS complex is turned upside and the next is turned downside.

This QRS variations may end spontaneously and, consequently, leading to syncope or it may evolve to ventricular fibrillation, that causes cardiac arrest.

There are several types of PVT, that while having similar EKG variations, don't respond the same way to medication. The most important types of PVT are:

• Connected with the Long QT Syndrome – Torsade de Pointes

• Not connected with the Long QT: Brugada Syndrome, Short QT Syndrome, Idiopathic Ventricular Fibrillation and Early Repolarization, Idiopathic Polymorphic VT from RVOT

• Short QT Syndrome: drug-induced, heart disease, ischemic VT, TV induced by exercise

The Torsade de Pointes is one of the most important forms of ventricular tachycardia. The term is French and represents the twisting and turning of the QRS complexes, around the EKG's isoelectric line. The mechanism that seems to cause this is the re-entry originated by prolonged desynchronized ventricular repolarization.

The clinical case we chose to study focuses in a 41 year-old woman in her second visit to the ER in two months, she had been admitted with abdominal pain and vomiting which then lead to ventricular fibrillation arrest which only reversed with defibrillation.

Keywords: Pointes, Polymorphic Tachycardia, Arrythmia.

HYPERTROPHIC MYOCARDIOPATHY

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Hypertrophic Cardiomyopathy is the most common genetic heart disease, defined by the presence of unexplained myocardial hypertrophy. It is associated with an increased risk of sudden cardiac death, heart failure and thromboembolic events. It is caused by more than 1,400 mutations in 11 or more genes encoding cardiac sarcomere proteins.

It is characterized by increased ventricular wall thickness and is highly complex due to its heterogeneous clinical presentation, various phenotypes, large number of associated causative mutations and wide spectrum of complications. Patients present clinical manifestations such as shortness of breath, chest pain, palpitations, and syncope, which are related to the emergence of diastolic dysfunction, obstruction of the left ventricle outflow tract, ischemia, atrial fibrillation, and abnormal vascular responses.

The clinical diagnosis is based on unexplained left ventricular hypertrophy identified by echocardiography or cardiovascular magnetic resonance imaging, other common electrocardiographic findings are, T-wave inversion in the left leads, enlargement of the left atrium, Q N wave in the V5 and v6 leads, as well as the presence of localized and diffuse changes in repolarization.

Patients experience clinical manifestations such as shortness of breath, chest pain, palpitations and syncope, which are related to the emergence of diastolic dysfunction, obstruction of the left ventricular outflow tract, ischemia, atrial fibrillation, and abnormal vascular responses whose main complication is sudden cardiac death.

Keywords: Hypertrophic Cardiomyopathy, Genetic Disease, Sudden Cardiac Death.

EATWELL GUIDE: RECOMMENDATIONS FOR FOOD BALANCE FROM UK

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Introduction: A food guide is a visual representation of the types and proportions of foods needed for a healthy balanced diet. The United Kingdom published is first national food model in 1994, and it has been updated since then. The most recent model, the Eatwell Guide, was published in March 2016. It represents United Kingdom government advice on a healthy, balanced diet and it's the key nutrition policy tool for health professionals and others working to improve dietary health.

Objectives: Analyze the current food guide in the United Kingdom and the health impacts and environmental footprints of this guide.

Methods: Publications from Public Health England were analysed. Literature review was conducted through PubMed database, using the expression "Eatwell guide ". It was obtained twenty articles from the last six years. After reading the titles and the abstract, two articles were selected for full reading and analysis.

Results: The Eatwell Guide divides the foods and drinks we consume into five main groups. The proportions shown are representative of food consumption over the period of a day or even a week, not necessarily each meal time.

Individuals with intermediate-to-high adherence to the Eatwell Guide had a 7% reduced risk of mortality. Increased adherence to the recommendation on red and processed meat consumption was associated with the largest decrease in environmental footprints.

Conclusion: Greater adherence to Eatwell Guide recommendations is related to health and environmental improvement.

Keywords: Eatwell Guide

FRENCH FOOD GUIDELINES

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Introduction: All countries have a food guide designed to educate consumer behaviour and, in some, inform a range of national food, nutrition and health policies. According to France's National Nutrition and Health Programme, launched in 2001, two preventative strategies were identified to achieve the goals: provide information and education to help individuals make healthy food and physical activity choices as well as, improve the diet and physical environment to make it easier to make healthy choices.
Objetive: Present the most recent food guideline of France.
Methods: Analysis of 4 scientific articles published in the last 5 years in pubmed related to the French food guide/guidelines.
Results: The food guide recommends increasing fruit and vegetable consumption to at least 5 servings a day, as well as including starch in the form of pasta, bread, rice, potatoes; fish, nuts, olive oil and dairy products in the diet. On the other hand, they advise limiting the consumption of processed meats, salty products, sweetened drinks and high-fat foods. The food guide suggests focusing on organic, seasonal and locally produced foods, preferring home-cooked meals and physical activity.
Conclusion: The French food guide meets the proposed objectives, acting by stipulating food consumption limits and recommending the presence of the nutri score on labels. However, the published guidelines are not only about food, but also about the inclusion of physical activity.

Keywords: Food guidelines, France, Food Education

MEXICAN FOOD GUIDE

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Introduction: A country's Food Guide is extremely important for teaching quality eating habits, in order to improve the population´s quality of life. That´s why it´s a very useful tool for people, but especially health professionals.
Objectives: The main objective is to present the food patterns/guidelines in Mexico, and to find out what impact these have on society.
Methods: The research for the work was carried out through the database of the Food and Agriculture Organization of the United Nations, previously directed to the food guide of Mexico. The literature review was carried out through google scholar databases using the term “Mexican food guide”. At first we selected 5 articles, of which we used only 2 for our poster. Scientific articles published in the last 5 years that address the topic ”food”, ”dietary guidelines” and”Mexico” were analyzed.
Results: The Mexican food guide is divided into 3 major groups: vegetables and fruits, cereals, legumes and foods of animal origin, with each group having a specific color, in this case, green, yellow and red, respectively. In addition, the Mexican food guide has ten messages and a main premise for the entire population, showing some good habits to be practiced to improve people´s quality of life.
Conclusion: Promote good health in all Mexicans through the prevention of Chronic noncommunicable diseases, overweight and obesity as well as the prevention of deficiencies of the most relevant vitamins and minerals for the population by following the recommendations and food guide of mexico.

Keywords: ”food”, ”dietary guidelines”, ”Mexico”

CHINA'S FOOD PATTERN

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Introduction: Over the past four decades, the Food and Agriculture Organization of the United Nations and China have enjoyed a strong partnership covering many the country's priority areas for food and agricultural development, including the sustainable intensification of agricultural production and the preservation of biodiversity and global health. A varied, grain-based diet maintains the characteristics of a traditional Chinese diet.
Objectives: To make known the Chinese dietary guidelines, which in turn are aimed at the general population, but include recommendations for specific population groups.
Methods: The scientific research for this paper was based primarily on the websites of the Food and Agriculture Organization of the United Nations and PubMed, which provided us with resources regarding the country, vegetarianism, and the nutritional transition over the decades in China. Twenty-three articles were obtained from 2015 to 2020, of which 9 were selected for reading and 4 were used concretely.
Results: China uses the "Pagoda Food Guide," with Chinese Dietary Guidelines for healthy individuals, which recommend consuming a varied diet. They explain ways to avoid food waste, to read labels, and to promote exercise. Also covered are topics such as pregnancy, newborns, and vegetarianism.
The guidelines were published during the period of rapid social and economic development in China, with the main goal of achieving a balanced dietary pattern, and there has been a drastic change in the lifestyle and eating habits of the Chinese population in the last decade.
Conclusions: A closer and more specific look is taken at the healthy and balanced lifestyle, how it impacts the Chinese population and what challenges they face.

Keywords: China, food, sustainable, healthy

DIETARY GUIDELINES FOR AMERICAN INFANTS AND TODDLERS 2020-2025

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Introduction: In order to maintain a healthy nutrition is important to know that every stage of life has distinct and unique needs, and it's own disease risks. In this early stage, the first 24 months, it's important to follow dietary guidelines and respect everyone's needs, in order to achieve a balanced diet, so that later in life, the child can become a healthy and happy adult.

Purpose/objective: To show the United States of America guidelines for healthy eating regarding the age group from zero to two years old.

Methodology: It was made a critical analysis of the American's dietary guidelines, for 2020-2025, the age from birth to two years old was specifically chosen, for a more detailed presentation.

Results: Human breast milk or infant formula should be the only food given from birth to 6 months, after that, solids from all food groups should be introduced, including allergens. The supply of vitamin D should start after birth, other micronutrients, later. Limiting dietary components such as added sugars and sodium is mandatory in this critical period of the child's growth and development.

Conclusions: These guidelines were developed by a group of health professionals, based in the current body of scientific evidence on dietary habits that can promote health, meet nutrient needs and prevent chronic diseases. It's important to lead consumers to adopt healthy dietary patterns, that will influence adult health and well-being.

Keywords: Dietary Guidelines for American; Infants and toddlers; Recommendations; Healthy eating

FOOD-BASED DIETARY GUIDELINE – SPAIN

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Introduction: In most parts of the world, there is a huge imbalance in the way people eat. As a way of solving these problems, food guides were created for all countries.
Food-based dietary guidelines (FBDGs) propose a set of recommendations in terms of foods, food groups and dietary patterns, in order to educate consumers and provide direction on programs and policies aiming to achieve healthy diets for all.
Objectives: In this work, it's intend to present about the Spanish's dietary guidelines, what distinguishes it from other countries, one of its typical dishes that could be introduced in our diet and its benefits.
Methods: In order to learn more about Spanish's diet, research was carried out on the type of guide they used, the type of diet they adopted, and the foods they consume in their daily lives. For this, searches were made for articles and sites and ten were found through the selected keywords, and among them, six were included, being the most relevant to this study.
Results: This food guide is based on the food pyramid, with dietary recommendations in line with the traditional Mediterranean diet, being divided into food groups classified into three levels of consumption, including recommendations on physical activity.
One of its typical dishes that could be included in the portuguese diet would be Escalivada, due to its low calorie and high fiber content.
Conclusion: With the analysis and research carried out to for this work, it was able to deepen more knowledge about the Spanish food guide and what distinguishes it from other countries. Its food guide has unique characteristics, presenting a food pyramid divided into daily, weekly and occasional consumption, including the practice of physical exercise, in order to satisfy the nutritional needs and contribute to the energy balance of each individual.

Keywords: Food-based dietary guidelines; FBDGs; Spain; Mediterranean diet; Food pyramid.

CANADA'S DIETARY GUIDELINES

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Introduction: Canada's Food Guide was created in 1942 during a time of war when the need to rationalize food arose, in order to prevent nutritional deficiencies.
Objective: The main objective is to expose Canada's food guide and to understand how it might be used as a tool to promote healthy and sustainable food habits in the community.
Methodology: This work was based on the Food and Agriculture Organization website -Canada food dietary guidelines section. There were found several articles, from which we chose five based on their relevance for the purpose of this work.
Results: Canada's Food Guide is based in three groups: proteins, vegetables, fruits and grains and it focuses mostly on providing alternatives to prepare meals in order to introduce certain ingredients/ foods into the diet.
The Canadian Food Guide is presented in four sections : "Nutritious foods are the basis for a healthy diet"; "Foods and drinks that harm healthy eating"; "Eating skills are necessary to navigate the complex food environment and support healthy eating" and "Implementation of dietary guidelines".
Discussion: Some differences and similarities between Canadian and Portuguese food guides will be discussed.
Conclusion: The Food Guide is a fundamental resource for the development of nutritional policies, it is used to promote healthy habits for the entire population, as well as support health professionals in nutrition education .

Keywords: Canada; guidelines and food

THE IMPORTANCE OF JAPANESE FOOD GUIDES FOR THE POPULATION

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Introduction: On account of poor eating habits and the high incidence of diseases such as obesity, diabetes and cardiovascular diseases, the need to develop a food guide arose, created in 2005 to try to re-educate the Japanese population

Objectives: To present and explain the Spinning Top Japanese Food Guide (JFG-ST), disclosing its impact on the Japanese population.

Methods: The literature review was conducted through PubMed and ScienceDirect databases using the terms "Dietary guidelines" "Japanese Food Guide Spinning Top". Seventeen articles from the last fifteen years were obtained. Of these, five articles were selected.

Results: The JFG-ST was created to promote food education, emphasizing the importance of proper nutrition to combat poor eating habits, eating disorders, and the increase in lifestyle-related diseases. The "Shokuiku Basic Law" was passed, which was the first law regulating diets and eating habits, so that the population would have access to and knowledge about healthy eating patterns. A study was conducted to investigate the influence of awareness of the JFG-ST on eating behavior and obesity in this country. The study revealed that knowledge of the dietary guide indirectly influences BMI and abdominal obesity through changes in eating behavior.

Conclusion: The promotion of the JFG-ST and the adoption of the "Shokuiku Basic Law" are food and nutrition education tools to help people practice healthy eating, playing an extremely important role in children's development and enabling adults to live long healthy lives.

Keywords: Dietary guidelines; Japanese Food Guide Spinning Top; Shokuiku; Health promotion

READING AND CHOOSING REGIONAL PRODUCTS UNITED BY HEALTHIER SCHOOL ALIMENTATION

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Introduction: In Brazil, in 1988, education and food were institutionalized as fundamental rights. Brazil understands that malnutrition not only affects people's health and well-being, but also has social and economic consequences. Therefore, the country assumed commitments, highlighting two projects to include nutrition topics on the covers of textbooks distributed universally and free of charge to all Brazilian public schools.

Objectives: The purchase of regional foods promotes the provision of adequate, healthy and sustainable food at school as it increases the diversity of in natura foods. Reading can also be a way to learn about better nutrition.

Methods: Articles were searched on the Food and Agriculture Organization website with the description "alimentação brasil" within which 4 articles were found with the theme Brazilian food focused on sustainability, where 1 was selected.

Results: The interaction actions between the two programs made food education easier for young students and their parents. The book covers were analyzed by competent professionals to make their visualization even more appealing and educational. In addition, it prohibited the purchase of beverages of low nutritional value, restricted the purchase of ultra-processed foods and forced the inclusion of fresh fruits and vegetables weekly.

Conclusion: The educational program helped more young Brazilians to have the right to healthy food through the implementation of healthier habits and educational programs.

Keywords: Food and nutrition education; school feeding; nutrition programs and policies; food and nutrition security; Brazil

AUSTRALIAN DIETARY GUIDELINES

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Introduction: National food-based dietary guidelines provide recommendations on healthy diets and lifestyles, aiming to respond to a country's public health and nutrition priorities, food production, accessibility, among other factors. The guidelines propose a set of nutritional recommendations that provide the required nutrients to promote health and prevent diseases.
Objectives: The main objective is analyzing the Australian dietary guidelines, understand what are the recommendations and if the population is following the recommendations provided by these guidelines. This analysis will help to acknowledge what changes are made in people's health and wellbeing if they follow these.
Methods: To gather up the information were used sites like PubMed and ScienceDirect where we searched for the words - healthy diet; Australia; dietary guideline; lifestyle - we found several interesting articles and we chose two articles from the last three years. We also used the Food and Agriculture Organization (FAO) site.
Results: This research help to understand that the guidelines are used to provide information on the amounts of food and what food groups are best for our health. There is low adherence to the dietary guidelines and the people that follow the guidelines can't meet all five. Despite this, the benefits of following these are obvious and strategies must be found to encourage the population to follow them and educate people on health and wellbeing benefits that they may conquer.
Conclusion: It is important to note that there should be more adherence to the Australian people's ethical guidelines and more encouragement to captivate the population to a healthier lifestyle.

Keywords: Healthy diet; Australia; Dietary Guideline; Lifestyle; Food Groups

GOOD PRACTICES IN SWIMMING POOLS

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A prática recreativa associada à utilização de piscinas implica uma preocupação constante com a segurança e a saúde dos seus utentes. Embora existam inúmeros benefícios associados a atividades desportivas e terapêuticas resultantes da utilização destes espaços, existem também uma série de fatores que tornam as piscinas propensas a acidentes e infeções, garantindo assim que as condições adequadas para a sua utilização se tornem urgentes.
O objetivo deste estudo era compreender e analisar o conhecimento da população relativamente às boas práticas a ter em conta na utilização de piscinas. Assim, foi realizada uma revisão literária sobre o assunto e um levantamento populacional.
O estudo realizado com a população portuguesa sobre as Boas Práticas no uso de piscinas, permitiu tirar as seguintes conclusões, apesar da baixa frequência de tomar duches à entrada da piscina (26% dos inquiridos), o mesmo não ocorre quando sai da piscina (59% dos inquiridos). No que diz respeito ao uso da tampa de natação, 32% dos inquiridos nunca a usam enquanto utilizam a piscina, enquanto 28% dos inquiridos a usam sempre. Em relação à perceção da qualidade da água, uma percentagem mais elevada classificou-a positivamente, no entanto também é preocupante que exista uma percentagem superior a 20% que não a classifica da mesma forma, mostrando assim que ainda existem estabelecimentos que precisam de monitorização e controlo não só na qualidade da água, mas também em relação à qualidade do ar e dos equipamentos, uma vez que foram registadas inúmeras lesões e infeções por eles causadas.

Keywords: swimming pools, good practices, hygiene, health, safety, users

WASTEWATER TREATMENT PLANTS

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The human is completely dependent on water.The use we give it daily contributes to changes in its characteristics. Given this, it is necessary to have an adequate treatment in order to restore the safety and wholesomeness of water for new consumption.

The objective of this work is to understand the main functions and methods practiced in wastewater treatment plants, to approach positive and negative points and technologies that sought to give a new dynamic to water treatment. For this a literature review was carried out.

A wastewater treatment plant is an infrastructure where liquid effluents from several activities are channeled daily in order to be treated. The treatment involves three phases: liquid, solid, and gas. We can distinguish some types of wastewater treatment plants, such as conventional and compact, or other more recent solutions such as the phyto wastewater treatment plant.

Water is a commodity that is becoming increasingly scarce, with the world's drought level increasing and the population served getting smaller and smaller. The treatment process must be optimized in order to technically and economically obtain an excellent working efficiency.

The treatment in the wastewater treatment plants should lead to obtaining a high quality final effluent, thus allowing its reuse or disposal into the sea or river, preserving the water resources and public health.

Keywords: wastewater treatment plant, water, treatment, salubrity, consumption

CHILDREN'S EYES IN THE FACE OF GOOD PRACTICE AND THEIR KNOWLEDGE IN THE USE OF SWIMMING POOLS

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Since the 20th century, with the awareness of the health benefits associated with the use of swimming pools, combined with the remoteness of coastal bathing areas and/or their overcrowding, the demand for these types of facilities has increased significantly.

For children, the pool is synonymous of fun, but unfortunately it's often at these moments that fatalities occur.

Being fundamental to promote and provide benefits for the health and well-being of children and young people, since they are one of the main groups of users, this work aims to understand if children and young people know and understand the dangers associated with the use of swimming pools, and if they are aware of the rules, good practices to adopt and their importance.

The preparation of this work included the analysis of several articles related to this theme and the use of a questionnaire, applied to children and young people in some schools in Coimbra, in order to achieve our goals.

The vast majority of children and young people perceive that they know all or at least some of the good practices to have in a swimming pool, however they don't practice them as often and easily.

Regardless of their perception and what they practice, the majority of them know how to recognize all the measures presented to them as good practice.

Despite this, accidents keep happening due to their failure to follow good practices. More training actions should be implemented in order to increase children and young people's knowledge about good practices to be followed in swimming pools.

Keywords: Good practices to have in swimming pools, health, youth and children, accidents, diseases

LEVEL OF KNOWLEGDE AND GOOD PRACTICE IN THE FACE OF *LEGIONELLA*

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The World Health Organizationdescribe s *Legionella spp*. as the only member of a diverse population of micro-organisms that can colonize man-made water circuits.
They are bacteria capable of surviving in a wide range of environmental conditions that include, for example, temperature variations from 5°C to 63°C and pH from 5.5 to 8.9. *Legionella* infections may arise in epidemics or sporadic cases, epidemics are due to contact with the same source of Microorganisms and not to transmission between infec-ted persons. The infection is transmitted by inhalation of droplets of contaminated water vapor, aerosols, of such small dimensions that they transmit the bacteria to the lungs. It is not transmitted from person to person, or by ingestion of contaminated water.
This study aimed to evaluate the levels of knowledge and good practices of the Portuguese population in relation to *Legionella*, developing the theme and highlighting preventive measures. Thus, bibliographic reviews were carried out on the theme under study and the application of a questionnaire, with online response, to the portuguese population.
About 78% of the population surveyed recognizes that "Legionella bacteria is a mi-croorganism that causes a severe respiratory infection" this is the correct definition.
Considering the total population surveyed, 57% of respondents demonstrated a good level of knowledge, since they know that the symptoms of Legionnaires' Disease are quick.
With regard to *Legionella*, TSAs are responsible for the execution of health surveil-lance actions of systems, structures and activities with interaction in the environment, making a fundamental contribution in the area of prevention and control of *Legionella*, structures and activities with interaction in the environment, making a fundamental con-tribution in the area of prevention and control of *Legionella*, as well as the promotion of preventive and control activities, providing all technical support in determining corrective measures to minimise the risk.

Keywords: *Legionella*, Inhalation of droplets, Environmental Health

WASTE WATER TREATMENT - POLLUTION

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The water that reaches our homes is first captured from the water environment, then sent to the Water Treatment Plants where it's made suitable for consumption. It's stored in reservoirs and, from there, distributed to the population. After being used, it's collected and treated again to be returned to nature. The main pollutants in water include bacteria, viruses, parasites, fertilizers, pesticides, medicines, nitrates, phosphates, plastics, fecal waste, and even radioactive substances. The impact of Waste Water Treatment Plant discharges, on water quality, must be monitored and controlled because it's of vital importance to the health and quality of life of the population.

This study aims to evaluate the population's knowledge about the WWTP and associated pollution. For the accomplishment of the work a literature review was made and a questionnaire was applied to the population in general.

It is noteworthy that the population is aware of what the acronym WWTP means. Following on how to prevent pollution, we affirm that most of them know how to prevent it by "saving the cooking oil in a container and then drop it off at a recycler that accepts oil ", "putting the hairs of the hairbrush, pads/tampons and toilet paper in the undifferentiated waste container" and "leaving expired medications in a nearby pharmacy".

Through this study, we concluded that the general population is informed about the WWTPs. As for the associated pollution, people know how to prevent it, but do not put into practice those preventive measures.

Keywords: Waste Water Treatment, pollution, population, prevention, knowledge

PRESENCE OF CYANOBACTERIA IN SUFACE WATER AND ITS CONSEQUENCES ON PUBLIC HEALTH

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Water is the most abundant chemical compound on Earth and is indispensable for all terrestrial life forms. It is a fundamental resource for human and economic activities, namely agriculture, industry, leisure and tourism, thus contributing to the development of human societies.
Photosynthesis is its main mode of obtaining energy for metabolism. However, their cellular organization demonstrates that these microorganisms are prokaryotes and, therefore, biochemically and structurally very similar to bacteria.
With this work, we intend to analyze the impact and consequences of cyanobacteria on the populations public health and analyze their level of knowledge about their role. It was also a concept (in digital format) that achieved the level of knowledge about this matter.
From the results obtained from the evaluation of the level of knowledge of the population about the presence of cyanobacteria in water, where 34 answers were obtained, it was concluded that a part of the population understands what cyanobacteria are (73,5%) and that their presence is harmful to health (81,8%).
We can thus conclude that numerous factors influence the quality of the aquatic system, but if there is no accuracy in these measures, we can have our water wealth affected by reducing natural resources that are very important to maintain our quality of life.

Keywords: cyanobacteria, public health, water, ecosystem, population

INTERIOR PLANTS FOR REDUCING INDOOR AIR POLLUTION AND HEALTH RISKS

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The history of human ecology extends up to two million years. We are reliant on plants for everything we need, from food to shelter, and also plants supply our oxygen and are the sink for carbon dioxide. In the modern society, urbanities spend the greatest part of their time indoors. The increased energy efficiency of newer buildings, with substantially reduced air exchange rates, often results in an increase in the concentration of indoor air pollutants. The inner conditions of the office room should be considered one of the most influential factors on human health. Deterioration of indoor air quality can result in multiple chemical sensitivity, new house syndrome and sick buildings syndrome and a cross-section of physical symptoms for those exposed that negatively affect their quality of life. Technology for improving indoor quality continues to improve; however, technological advances are often expensive and not widely used. In some instances, the solution only replaces one pollutant with another. Plants represent a sustainable but underexploited solution to enhance indoor air quality. Greening the great indoors with living plants is an important element in enabling sustainable urban communities of the future.

Keywords: plants, reducing, indoor air pollution, health risks

GASTROINSTESTINAL AND HEPATIC DISEASE IN SYSTEMIC LUPUS ERYTHEMATOSUS

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Systemic Lupus Erythematosus (SLE) is a chronic connective tissue disease, potentially severe, that can involve articulations, kidneys, skin, mucous membranes and blood vessel walls. Also known as a prototype autoimmune disease by producing a wide range of autoantibodies.

SLE can appear in every age, although usually appears in younger womans between puberty and menopause. Its inicial manifestation is lupus enteritis. This, in turn, features three main variants: lupuseric vasculitis, intestinal pseudo-obstruction and protein losing enteropathy.

Gastrointestinal symptoms are also common and may occur in approximately half of people with SLE. Although it is more common in pacients with SLE, are rarely due to the active involvement of the organic system of the disease itself which means occur in patients with SLE but are not directly attributable to the disease.

The presence of gastrointestinal disease in SLE pacients aggravate the clinic board of SLE being an important cause of morbidity and mortality and, for that, it is very important to rapidly diagnose and treat appropriately for the gastrointestinal manifestations associated with SLE due to the potencial for organ complications and life threatening.

Our aim is to understand the impact of gastroinstestinal disease in Systemic Lupus Erythematosus and how they can be an exacerbate dignosis and prognosis.

Keywords: gastrointestinal symptoms; Systemic Lupus Erythematosus; lupus enteritis; enteral vasculitis; intestinal pseudo-obstruction; protein losing enteropathy.

LACTOSE INTOLERANCE: COMMON MISUNDERSTANDINGS

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Lactose intolerance is a condition characterized by a variety of symptoms triggered by the ingestion of lactose-containing foods. When lactase activity in the brush border of the small intestinal mucosa is diminished, it causes one of the most prevalent types of food intolerance. Lactose intolerance can range from mild to severe, depending on the intensity of the symptoms.
When lactose is not digested, the gut bacteria ferments it, causing lactose intolerance symptoms such as stomach discomfort, bloating, gas, and diarrhea, with significant intraindividual and interindividual variations in the degree of clinical manifestations.
These gastrointestinal symptoms might be mistakenly characterized as "milk allergy" symptoms since they are similar to cow's milk allergy symptoms. Because there are significant differences between lactose intolerance and cow's milk allergy, a greater awareness of these distinctions should help to avoid errors in the diagnosis and treatment of both disorders.
Base on the above, our aim is to understand and disclose the impact of lactose intolerance on an individual's daily life and how we can diagnose this pathology.

Keywords: Lactose Intolerance; lactase; gastrointestinal symptoms

VITAMIN D: A MAGIC BULLET OR A MYTH?

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Vitamin D is a fat-soluble vitamin important in calcium and phosphorus homeostasis. The most important ones are D2 and D3. Vitamin D2 is found in plant extracts and D3 in animal products. Beyond diet, D3 is synthesized in the skin by UV irradiation of 7-dehydrocholesterol and its hydroxylation occurs in the kidney. Since vitamin D receptors were found in several cells of the human body, the interest increased and after several studies, it is suspected that vitamin D has more impact on human health than bone health. The results of studies that showed a beneficial intervention effect on primary or secondary outcome variables are compiled. Studies on the link between vitamin D deficiency and cancer, cardiovascular disease, autoimmune disease, inflammation, and severe illness are still being reviewed. This vitamin's metabolism, endogenous generation, food intake, activation, and transport in the body were all investigated and the vast majority of controlled trials have found no clear benefit. Based on these findings and the altered receptor concentrations, which result in low plasma Vitamin D levels but not low active levels during disease-related inflammation, the presumed high incidence of Vitamin D shortages is called into question.

Objective: Our aim is to understand whether, in fact, vitamin D is a magic bullet or a myth and its association with diseases.

Keywords: vitamin D, calcium, phosphorus, bone health, UV irradiation.

BLUEBERRY AS AN ATTRACTIVE FUNCTIONAL FRUIT TO PREVENT (PRE)DIABETES PROGRESSION

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Prediabetes is a high-risk condition for type 2 diabetes mellitus (T2DM) that is defined as a state of abnormal glucose homeostasis where blood glucose levels are elevated above those considered normal, but not as high as those required for a diagnosis of diabetes. Prevalence of prediabetes is increasing worldwide and it is expected an incidence of 470 million cases in 2030. Lifestyle therapy including physical exercise and dietary regimens enriched in phytochemicals with health-related properties are first-line interventions. Blueberries (Vaccinium spp.) have sparked widespread attention due to its unique flavor and plentifulness in beneficial phytochemicals. This fruit has been recommended for overt T2DM therapy due to its hypoglycemic and insulin-sensitizing effects, in addition to its strong antioxidant activity. However, blueberries address several other pathophysiological features associated with prediabetes, such as gut microbiota dysbiosis and hepatic dysmetabolism, for which pharmaceutical therapies are often postponed.

Our aim is to explore the importance of Blueberries as a valuable source of phytochemicals that can help prevent (pre)diabetes development. Moreover, we provide an updated analysis of the main cellular and molecular mechanisms by which BB phytochemicals are able to exert protective effects.

Keywords: prediabetes; blueberries; diabetes mellitus; gut microbiota dysbiosis; hepatic dysmetabolism.

ARE DRUG-SUPPLEMENT INTERACTIONS HARMFULL?

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Introduction: The consumption of Herbal and Dietary Supplement has been increasing in most of the developed countries. These, while beneficial to health, can be very harmful, especially when taken together with medications, as numerous interactions between herbal supplements and conventional drugs have been reported.

Aim: Our aim is to identify the possible interactions between Herbal and Dietary Supplements and Drugs.

Methods: A search was carried out on PubMed, with the following keywords: “Herbal and Dietary Supplement Interactions with Drugs”, to selected 2 articles was restricted to review articles and meta-analyses. We also researched the book “Handbook of Food-Drug Interactions” in chapter 13.

Results: It was possible to verify that the most relevant supplement-drug interactions were with St. John’s wort, Gingko Biloba, Green Tea extract, Garlic and both Asian and American Ginseng. Many supplements can cause interactions with some medications but are safe with others (e.g., Garlic, Asian Ginseng and Green Tea extract). Others have a small chance of drug interactions and can cautiously be taken with most drugs (e.g., Ginkgo and American ginseng). Results suggests that, except for Green Tea extract, all the supplements mentioned above may interact with Warfarin, among other types of medication (e.g., antidepressants or antiretroviral). Despite everything, all should be taken with caution when taking medication.

Conclusion: We know that many interactions can occur and be harmful, thus, to ensure patients don’t experience adverse consequences, health professionals should be aware of new information regarding drug-supplement interactions.

Keywords: Supplement-Drug Interactions, Supplement Interactions with Drugs

INTERACTION OF WARFARIN WITH CERTAIN FOODS AND PLANTS

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Introduction: Warfarin is an oral anticoagulant used to normalize the coagulation process. Its mechanism of action involves inhibiting the activation of vitamin K-dependent clotting factors. This drug may present adverse effects when consumed improperly or when it interacts with certain foods and plants.

Aim: Analyze the potential effects of warfarin interactions with certain foods and plants.

Methods: A review of several articles referred us to PubMed using the keywords "food" "warfarin" "herbs" "vitamin k" with the determinant "AND". They were selected by the titles, then an abstract analysis, only choosing 10 articles. After reading and analyzing all the articles, we addressed only 3 articles published between 2005 and 2021.

Results: Herbs and foods that have shown the greatest potential to interact with warfarin include garlic, ginger, ginkgo, St. John's wort, cranberry, and ginseng, i.e., plants normally consumed as food and also used for therapeutic purposes. These may alter the normal functioning of warfarin by inhibiting platelet aggregation or due to excessive vitamin K consumption.

Conclusion: Given the frequency of reports, plausibility and severity of reported adverse events, including internal bleeding and INR dysregulation, care is needed with concomitant consumption of various herbal products, dietary products and warfarin foods. In this way, continuous monitoring is required and the identification of imminent sources of variability is necessary to achieve safe and effective anticoagulation.

Keywords: "food", "warfarin", "herbs", "vitamin k"

IS THERE AN ASSOCIATION BETWEEN LONG-TERM METFORMIN THERAPY AND VITAMIN B12 DEFICIENCY?

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Introduction: Metformin is the most used oral insulin-sensitizing agent, being prescribed for diseases, particularly type 2 diabetes. Over the last few years, there has been recognized a consequence of a long-term metformin therapy on vitamin B12 deficiency.

Methods: Literature review was conducted in the databases PubMed and ScienceDirect. This research was restricted to information and review articles, published in the last 10 years, combining the following keywords: “Metformin”; “Vitamin B12 deficiency” and “Type 2 diabetes”. After title and abstract analysis of 10 articles, it was selected 5, and from that, after full reading, it was included in this study 3 articles.

Objective: To analyze the relation between long-term metformin therapy and increased prevalence of vitamin B12 deficiency.

Results: Although metformin is considered the first-line oral glucose-lowering drug for the treatment of type 2 diabetes, in long-term therapy it can decrease vitamin B12 levels. There are several proposed mechanisms to explain how metformin interferes with the absorption of this vitamin. The most currently accepted mechanism suggests that metformin antagonizes the calcium cation and interferes with the calcium-dependent IF-vitamin B12 complex binding to the ileal cubilin receptor.

Conclusion: There is almost a consensus on metformin’s potential to lower vitamin B12 levels, causing mainly neurological and hematological manifestations. However, further studies are needed to identify the risk factors for the B12 deficit. The better understanding of these variables will contribute to improve the screening and prevention of the B12 deficiency in type 2 diabetes mellitus.

Keywords: “Metformin”; “Vitamin B12 deficiency”; “Type 2 diabetes”.

GRAPEFRUIT: AN ENEMY FOR PHARMACEUTICALS

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Introduction: Grapefruit juice is consumed widely as a protector against cardiovascular diseases and cancers. It has, however, been found to be an inhibitor of the cytochrome P450 3A4 system (CYP 3 A4), which is responsible for the first pass metabolism of many drugs and the P – glycoprotein pump (Pgp), found in the brush border of the intestinal wall.
Aim: To analyze the drug interaction with the consumption of grapefruit.
Methods: The research was carried out on PubMed, and Google Scholar using as key-words: "Grapefruit", “Pharmaceuticals”, “Drugs” and “Interaction”. The title was read and subsequently the abstract and the full text to choose the most relevant article. Research was restricted for articles from 2007 until today.
Results: Grapefruit juice can significantly increase the bioavailability of oral drugs by decreasing their pre-systemic metabolism. The mechanism of action involves the inhibition CYP 3 A4, which is found in the liver and intestinal wall, of Pgp, another membrane transporter located in enterocytes, of the protein 2 resistant to multiple drugs (MRP2), closely related to Pgp in terms of its expression and function, and several organic anion transporting polypeptides (OATPs in vitro), involved in apical-basal drug transport in the small intestine.
Conclusions: Many food varieties have the potential to require dosage adjustment to maintain drug concentrations within their therapeutic windows, especially with drugs that exhibit high first-pass degradation. Grapefruit shows high variability in the magnitude of the effect between individuals, however more research is needed to determine the clinical importance of its effects on drug metabolism and transport.

Keywords: "Grapefruit", “Pharmaceuticals”, “Interaction”, “Drugs”

POTENTIAL INTERACTION BETWEEN VITAMIN K-RICH FOODS AND ORAL ANTICOAGULATION WITH COUMARINS

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Vitamin K plays an important role in blood coagulation, particularly in the synthesis of several coagulation factors. Its main food sources are dark green leafy vegetables and vegetable oils. Excessive intake of vitamin K or its deficit may interfere with anticoagulant therapy, particularly Warfarin, the oral anticoagulant generally used for prophylaxis and treatment of thromboembolic phenomena, with inherent undesirable effects on patients' health.

Understanding the interaction between vitamin k-rich foods and oral anticoagulation, potential risk, and dietary recommendations.

Research was conducted on PubMed and Google Scholar, using the following keywords: “vitamin K”, “nutrition”, “vitamin k-rich foods”, “anticoagulation therapy”, “VKA’s”. To selected 6 articles published between 2001 and 2021.

The use of Warfarin is monitored by the prothrombin time, with the international normalized ratio (INR) and has a desired therapeutic range between 2-3 to minimize the hemorrhagic risk. An excess of vitamin K decreases the anticoagulant effect of the drug, lowering the INR value, which translates into a hypercoagulability picture, with a higher risk of thromboembolic phenomena. On the other hand, vitamin K deficiency will have the opposite effect, increasing the INR value and consequently increasing the hemorrhagic risk.

In patients with a healthy balanced diet, there seems to be no risk of an excessive or deficient intake of vitamin K that could interfere with anticoagulant therapy with Warfarin. It is recommended that patients maintain their usual and constant intake of vitamin K, informing the attending physician in case of any changes in dietary habits that justify an adjustment in the dose of oral anticoagulant.

Keywords: vitamin K, nutrition, vitamin k-rich foods, anticoagulation therapy, VKA’s

RESVERATROL EFFECTS IN ARTERIAL FIBRILLATION

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Introduction: Resveratrol is the most common phenolic compound present in grapes and red wine (average 1.9 ± 1.7 mg of trans-resveratrol/L, ranging from non-detectable levels up to 14.3 mg/L). The amount of resveratrol in wine is related to the permanence of the grape skins at the fermentation process. This concentration is significantly higher in red wine than in white wine. In pharmacological research, we have found that resveratrol exerts anti-cancer, anti-bacterial, anti-fatigue effects and cardioprotective properties. Atrial fibrillation (AF) is the most common cardiac arrhythmia, although current therapies are suboptimal.

Objective: Study the role of resveratrol in the treatment of some cardiovascular diseases, especially atrial fibrillation.

Methodology: Literature review was conducted on PubMed with the keywords: “resveratrol”, “resveratrol and red wine” and “resveratrol and atrial fibrillation”. After title and abstract analysis, we selected 7 articles from 2015 to 2022.

Discussion: Resveratrol can cause a suppression in AF, via gene expression activation of phosphoinositide 3-kinase (PI3K)/Protein kinase B (Akt)/endothelial nitric oxide synthase (eNOS). This plays a role in the inhibition of pathological signalling cascades in AF. Resveratrol influences also the inhibition of hypertrophic cardiac remodelling process via activation of AMP activated kinase (AMPK) and subsequent inhibition of NFAT activation, which has been implicated in the development of AF.

Conclusion: The intake of red wine and resveratrol may have an influence on the reduction or treatment of atrial fibrillation. However, excessive consumption of wine may increase the risk of cardiovascular diseases, as does alcohol intake.

Keywords: “resveratrol”, “resveratrol and red wine”, "resveratrol and atrial fibrillation"

POLYPHARMACY AND MALNUTRITION

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Introduction: Polypharmacy is a frequently occurring global problem and is defined as a condition in which the patient is treated with multiple medications, usually five or more.
Objectives: To understand if polypharmacy impacts nutritional status and how they relate.
Methods: A search was conducted in the PubMed database. A literature review of research articles, published in recent years, using the keywords "polypharmacy" and "nutrition". Using the above keywords, 61 articles were obtained. Six articles were selected after title and abstract analysis, and 4 of these were used after reading in full.
Results: Medications have the ability to affect nutritional status negatively, especially as their number increases. That is, polypharmacy degrades nutritional status and, it is known that degraded nutritional status promotes increased doses of drugs with the consequent occurrence of undesirable side effects, constituting a vicious cycle between both situations. However, the impact of the medications seems to be significant only when a fairly high number is used.
Conclusion: Based on the evidence, the independent role of polypharmacy on nutritional status is unclear, requiring further studies on the subject. Although recent evidence confirms the existence of a negative synergistic effect between polypharmacy and malnutrition, regarding elderly outcomes.

Keywords: Polypharmacy and Nutrition

INTERACTION BETWEEN ANTIBIOTICS AND DAIRY PRODUCTS

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Introduction: An antibiotic is essentially an antibacterial agent that provides treatment of certain bacteria but not holistic treatment of all bacteria.

Antibiotic use is correlated with the emergence and maintenance of antibiotic-resistant traits within pathogenic strains . The increasing prevalence of antimicrobial resistance is a significant threat to global health. The continuous high exposure of animals to antibiotics promotes the development of antimicrobial resistance. These resistant bacteria can be transmitted through the consumption of animal products, most notably dairy products.

Objective: Understand how antibiotics interact with dairy products and what problems they can cause to humans.

Methodology:We conducted a research in databases such as PubMed and Science Direct, with the following keywords: “dairy”; “antibiotics”; “interaction”, to selected 8 articles from 2012 to 2022

Results: Milk products contain antibiotic resistance genes (ARGs), which are reservoirs of infection within a phage and can be transmitted to susceptible hosts either in the food matrix or in the intestinal tract after ingestion. In milk in particular, the resistance of bacterial DNA should be investigated, whether it already exists in the cow's udder or whether it is only contaminated during milking or afterwards.The bacterial composition of milk can be affected by heat treatment, without that procedure the bacteria present in milk can multiply. On the other hand, in UHT milk, some bacterial DNA may be degraded.

Conclusion: Unprocessed dairy products may play a role in the development of antimicrobial resistance in human pathogens.

Keywords: “dairy”; “antibiotics”; “interaction”

INTERACTION BETWEEN BISPHOSPHONATES AND FOOD

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Osteoporosis leads to a gradual loss of bone mineral density (BMD). Although oral bisphosphonates are the most recommended treatment, they have low bioavailability, which is further diminished by ingestion of food, hence jeopardizing the treatment's efficacy.

This review aims to assess the interaction between bisphosphonates with food, beverages, and dietary supplements in osteoporosis' treatment. We conducted a research in databases such as PubMed with the following keywords: "osteoporosis"; "bisphosphonates"; "food"; "beverage"; "dietary supplements" and "interaction", selecting 3 articles from 2000 to 2021. Oral bioavailability while fasting of bisphosphonates ranged from 0.6% to 3%, and food and some beverages reduce their absorption rate. Recommendations suggest that most bisphosphonates should be ingested at least 30 minutes before breakfast with water, except for delayed-release tablets of risedronate, which should be ingested immediately after breakfast. All drugs should be taken at least 2 hours before any preparation rich in iron. One study investigated if dietary calcium intake or vitamin D status could influence the effect of zoledronate (an intravenous bisphosphonate). The authors found no interactions between calcium, vitamin D and the effects of the drug on BMD, bone turnover, and the number of acute phase reactions. Significant interactions exist between oral bisphosphonates and food intake, reducing even further their already low bioavailability. Therefore, optimal dosing regimen for these drugs should always consider eating schedules and patient's dietary supplementation, so that the treatment of osteoporosis be the most efficacious possible.

Keywords: Bisphosphonates, food-drug interaction, literature review, osteoporosis.

INTERACTION BETWEEN GRAPEFRUIT JUICE AND FELODIPINE

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Introduction: The interaction between drugs and food in a commun phenomenon which can be favorable or unfavorable to the drug's absorption. The interaction between the ingestion of grapefruit juice and cardiovascular drugs, specifically felodipine, has been known for some time. Felodipine is a calcium antagonist used to control hypertension, and its absorption may be increased due to the ingestion of grapefruit juice.
Objective: Understand the interaction between grapefruit juice and felodipine.
Methods: It was conducted a research in Pubmed, on april, with the key words ''interaction'', ''drugs'' and ''food'', which resulted in a selection based on the title of 10 articles, an analysis of the abstract excluded 2 articles and finally with the reading of the full article remained 6 articles.
Results: Cytochrome P450 3A4 (CYP3A4) is an important enterocyte present in the liver and in the intestine, and several findings point to grapefruit juice having a major effect on the intestinal CYP system by inhibiting it with a minor effect at the hepatic level, due to the flavonoids and non-flavonoids components of the juice. Inhibition of CYP3A4 causes an increase in the plasma concentration of the drug, without changing the half-life of the drug, leading to an increase in the bioavailability of the drug.
Conclusion: Grapefruit juice interferes with the action of calcium channel blockers, increasing their bioavailability. With the inhibition of CYP3A4, an increase in drug concentration is expected, which is reflected in an increase in adverse effects, and may even be fatal.

Keywords: 'Felodipine'';Grapefruit juice''; ''Cytochrome''; ''Absorption''

THE INFLUENCE OF ANTIPSYCHOTICS ON BODY WEIGHT

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Introduction: During the last decade, the prevalence of mental disorders has increased significantly, causing significant adverse effects on the health of individuals. Second-generation antipsychotic medication is the base of treatment for psychotic disorders such as bipolar disorder, severe depression, insomnia and anxiety. Weight gain is the main adverse effect of second-generation antipsychotics, affecting quality of life, personal recovery, and somatic morbidity and is a common reason for discontinuing antipsychotics. Several mechanisms may explain the weight gain caused by antidepressants and psychotropics.

Objective: To analyze the influence of antipsychotics on body weight.

Methodology: A research for articles was carried out in the database PubMed with the keywords: "body weight", "antipsychotics" and "weight gain". To selected 5 articles dated between 2015 and 2022.

Results: The number of people receiving antipsychotic drugs is considerably high. Up to 80% of patients taking antipsychotic medication develop weight gain that oversteps ideal body weight by at least 20%. The greatest weight gain effect is consistently associated with olanzapine and clozapine. Weight gain is more evident in people with normal baseline body weight and more in women than in men, and it appears that pediatric patients demonstrate greater weight gain than adults. The antidepressant associated with weight loss was bupropion, which should be the first-line drug for overweight and obese individuals. There is no knowledge of why this drug causes weight loss, it is only known that it plays an important role in the regulation of appetite, satiety and food desire.

Conclusion: Clozapine and olanzapine are the substances with the highest risk of weight gain, while aripiprazole, lurasidone and ziprasidone constitute the group of substances with the lowest risk. Further research is needed to determine the pathophysiology of psychotic-induced weight gain, and pharmacogenomic research is very importante to understand this mecanism.

Keywords: "antipsychotics"; "body weight"; "weight gain"

"PUREED FRUIT POUCHES": AN ALTERNATIVE TO FRUIT?

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Introduction: Around six months of age, food diversification begins, as breast milk becomes insufficient to meet the nutritional needs of infants. Complementary feeding is introduced to provide the energy and nutrients needed for healthy growth and development. Over the years, the variety of new types of commercial foods has increased, such as purees and semi-liquid foods packaged in squeezable plastic bags for babies and young children.

Objective: Understand the nutritional composition of the various bags of pureed fruit for infants and analyse if these products can/should be used as a fruit substitute.

Methods: Collect information from all brands that sell pureed fruit bags for infants in the Portuguese market, between march and april, selected three brands and three types of fruit (banana, apple and peach), proceeded with a nutritional analysis of the labels, and compared to nutritional values of fruit in nature.

Results: No significant differences were found in energy, carbohydrates, sugars, protein, and saturated lipids between the pureed fruit and fruit in nature. Concerning the values of lipids and fiber, the fruit bags have a lower value when compared to the average values of the fruit. Regarding the price for 100g, pureed fruit for babies has a price five times higher than the price of fruit.

Conclusion: Fruit bags can be a viable alternative to fruit sporadically, once or twice a week, because it is more practical since fruit remains a better option in nutritional and economic terms.

Keywords: "Pureed Fruit Pouches"; "Food Technology" and "Nutrition"

ACTIVATED CHARCOAL: NUTRITIONAL INTEREST.

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Introduction: Activated carbon for food purposes is generally obtained from botanical sources by carbonizing raw materials at about 700-1000°C for 4 h in a nitrogen gas atmosphere. For several decades, activated carbon has found utility in the food industry, its main application being the removal of components such as toxins and anti-nutrients. In recent years, a bread made with activated charcoal has emerged to modify its texture and sensory characteristics.
Objectives: Understand the nutritional interest of the active charcoal, specifically in bread.
Methods: A market study was carried out from March to May in establishments that sell bakery products and retail establishments, the inclusion criterion was the breads with activated charcoal. The aim of the study was to compare macronutrients between breads with and without activated charcoal.
Results: Comparison of wheat bread with and without activated carbon: 11% energy reduction; 3% protein reduction; 13,5 % carbohydrates reduction; 7% increase in carbohydrates of which sugars, 23% lipid reduction; 63% increase of lipids of which saturated and 11% reduction of salt. Comparison of wheat and rye with and without activated charcoal: energy increase by 18%; protein increase by 22%; increase in carbohydrates by 13%; increase in carbohydrates of which sugars by 21%; lipid increase by 34%; increase in lipids of which saturated by 38% and increase in salt by 40%.
Conclusion: When analyzing the results, was observed that it's impossible to establish a nutritional change from the addition of activated charcoal in bread, merely for an aesthetic level.

Keywords: "activated carbon"; "bread"; "wheat"; "rye"

SUGAR-FREE COOKIES: ENEMIES OR FRENEMIES?

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Cookies are characterized by foods rich in sugars, fat, and salt. In recent years, several initiatives have been developed to improve the nutritional quality of this type of product due to the increased incidence of chronic diseases. This comparative nutritional analysis is intended to understand how reducing the sugar content in cookies from different brands increases the fat content and/or adds additives such as sweeteners. Understand the cost impact on the market and the benefits of prescribing these cookies as a more healthy food choice. The information collection resulted in an analysis of nutritional cookie labels and the price of four retail trade chains from March to April 2022. The sample included cookies with main ingredients such as flour, eggs, fat, sugar or sweeteners, excluding those containing other added components (ex. filling, waffles, various chips, etc.). The samples were analyzed by comparing cookies with no sugar and added sugar. It was verified that the “non-sugar” cookies had a high lipid content, about 1/100g of cookies. Instead of added sugar, “non-sugar” cookies had additives such as polyols and cornflour, about 15,9 and 50,6 respectively in 100g of cookies. Furthermore, we perceive that cookies with no sugar have a higher cost than cookies, increasing by one euro. Cookies with reduced sugar from different brands show that the fat content increases and additives such as polyols and cornflour are added to the sugar-free cookies; therefore, these are not a better nutritional choice. Their prescription depends on each individual and its characteristics.

Keywords: “Cookies”, “Sugar”, “Fat”, “Additives”, “Sweeteners”.

NUTRITIONAL PERSPECTIVE OF LACTOSE-FREE YOGHURTS AND VEGAN ALTERNATIVES

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Introduction: Lactose is the sugar naturally present in milk and milk products. Lactose Intolerance occurs due to Lactase Enzyme deficiency. The replacement of milk and its derivatives with lactose-free alternatives is essential to reduce the symptoms associated with Lactose Intolerance.Objective: This research aims to assess the economic-nutritional yoghurts available on the market in Portugal, with their lactose-free equivalents and plant-based alternatives. Methodology: This investigation was based on the nutritional information provided by the labels of the yoghurts under study (calorie, macro and micronutrient values) and price range. The information was collected through online food commercial platforms between March and April 2022. Results: Lactose-free yoghurts and vegan alternatives have a higher energy value (17.4% and 33.2% per 100g), the highest amount of carbohydrates (20.2% and 30.4% per 100g) and carbohydrates, which are sugars (24% and 19.5% per 100g), compared to yoghurts with lactose. Lactose-free yoghurts have lower calcium (14.5% per 100g) than yoghurts with lactose. Economically, lactose-free yoghurts and plant-based alternatives have a higher price (€0.17 and €0.56 more per unit) than yoghurt with lactose. Conclusion: It was possible to assess the economic and nutritional differences between yoghurts available on the market and their lactose-free equivalents and plant-based alternatives.

Keywords: Lactose-free yoghurts; Vegan yoghurts; Lactose Intolerance;

THE NEED OF VIT. D FORTIFIED DAIRY PRODUCTS IN ADULTS

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Introduction: Vitamin D is an essential micronutrient for calcium absorption and bone health, synthesized during sun exposure. Vitamin D deficiency, at any age, is a relevant problem worldwide due to its low production in the skin during the winter months and/or limited intake in typical diets. The fortification of staple foods, such as cow milk and yogurt, has been adopted to improve individuals' vitamin D status. According to Food and Drug Administration, the accepted levels for vitamin D is 400-600 IU per quart of milk.

Objective: To analyze dairy products fortified with vitamin D, their concentration and the differences between these and non-fortified products.

Methodology: Dairy products were analyzed from food retail chains in march 2022. Dairy products such as milk, powdered milk, yogurts, kefir and dairy desserts were chosen, as they were the only fortified products.

Results: Vitamin D fortified products such as milk, milk powder, yogurts and dairy desserts were more expensive than non-fortified products. There was a greater supply of fortified products for children compared to adults.

Conclusion: Mandatory or voluntary fortification of foods with vitamin D may be a mechanism to increase dietary intake of Vitamin D. A consumption of 2-3 servings of fortified dairy products will reach the recommended dose, without the need for sun exposure. However, a broader fortification of food kinds with vitamin D has been suggested, instead of focusing on just a few staple foods. The development of new studies can improve individuals' vitamin D status.

Keywords: "Dairy Products"; "Fortification"; "Milk"; "Vitamin D"; "Yogurt".

IS GHEE THE NEW BUTTER?

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Introduction: Currently, the consumption of Ghee has been increasing, claiming to be a better option than butter. Ghee is a dairy product obtained from clarifying butter. Butter is a product obtained exclusively from cow's milk or cream and is presented in the form of a solid and malleable emulsion. These products should be consumed in moderation because they're rich in saturated fatty acids. It isn't recommended to exceed three portions a day since excessive consumption can increase the risk of dyslipidemia, obesity, and cardiovascular disease.
Objective: To assess the differences between butter and Ghee from a nutritional and economic point of view.
Methodology: Research was conducted on online platforms and commercial surfaces of the products: kinds of butter and Ghee. Forty-one products were analyzed, considering their respective price and nutritional composition.
Results: It was found that the nutritional differences between butter and Ghee are significant, with a disparity in energy values, lipids and price. On average, Ghee is 25€ more expensive than butter. Ghee has higher energy and lipid values, differing in 150 kcal, 16g of lipids and 10g of lipids, including saturated ones. The only advantage observed was the reduced salt content, equating to unsalted butter. Low-fat butter is the better nutritionally alternative because of its reduced energy and lipid value, presenting approximately half of the previous values.
Conclusion: It was possible to assess the economic and nutritional differences, with low-fat butter being the recommended one, considering its low caloric value and lipid profile.

Keywords: Food technology; ghee; butter; health; nutrition

NUTRITIONAL STUDY OF SWEETENERS IN CHOCOLATE

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Introduction: Growing concerns about the adverse health effects of sugar have motivated people to reduce their consumption, particularly in chocolate, with sugar being replaced by sweeteners. These are low-digestible carbohydrate polymers with low energy values satisfying sweetening profiles. Several authorities recognise sweeteners as safe and well-tolerated, although there is controversy about their effects on human health.

Methodology: A market study on sugar-sweetened and artificial sweetened chocolates was conducted online and in physical supermarket chains. Forty plain chocolates of white, milk and dark types were selected and analysed for energy, macronutrient content and types of sweeteners.

Objective: To analyse the energy and macronutrient content of sugar-sweetened and artificial sweetened chocolates, characterise the type of sweeteners used and their health impact.

Results: White chocolate with sugar has higher amounts of fat (23%), saturated fat (76%), energy (11%) and sugars (78%) than white chocolate with sweeteners. However, the latter has higher amounts of protein (60%) and carbohydrates (16%).

In both dark and milk chocolate with sweeteners, the amounts of energy (9,9-26,6%) and sugars (84,9-96,3%) are lower than those with sugar. However, there is an inverse relationship in the value of carbohydrates (11,8-12,1%) in milk chocolate.

It was observed that maltitol was the most commonly used sweetener in chocolate with no added sugar (65,2%).

Conclusion: The results showed that chocolates with sweeteners are poor in most macronutrients and energy. Consumption should be limited since studies suggest that excessive consumption of sweeteners could contribute to metabolic changes that lead to obesity, diabetes and cardiovascular disease.

Keywords: Sweeteners, chocolate, sugar, nutrition, health impact

MARKET STUDY BETWEEN FRESH AND DEHYDRATION FRUIT: AN ECONOMIC AND NUTRITIONAL PERSPECTIVE

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Introduction: From a nutritional point of view, fruit is an essential part of a balanced diet, which plays a key role in the prevention of chronic diseases. Fruits are a natural source of energy, vitamins, minerals, and dietary fibres; however, the seasonality of fruits makes their consumption impossible throughout the year. Dehydration of fruit thus emerges as a method of food preservation with quality.

Aim: To understand the nutritional differences between fresh fruit and dehydrated fruit.

Methods: The nutritional information and price of fresh and dehydrated fruits were collected by going to different commercial establishments where macronutrient, salt and fibre values were collected from March to April 2022.

Results: The data comparing dried fruit and fresh fruit shows that the latter is the better option from a nutritional point of view. When analysing 100 grams, dehydrated fruit had 88.8% more calories, 36% more carbohydrates, 80.8% more sugars and 82.9% more fibre than fresh fruit. Concerning the price, it is higher for dehydrated fruit.

Conclusion: The consumer preference for fresh fruit over dried fruit is a wise choice since, with respect to nutritional composition, dried fruit is less beneficial.

Keywords: Dehydrated fruit, Food Technology, Fresh fruit

3D FOOD PRINTING: THE FUTURE OF THE INDUSTRY?

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Three-dimensional (3D) food printing, also known as additive manufacturing, uses computer-aided design software to control the layer-by-layer construction of 3D food, the most established extrusion-based method. This method uses edible materials such as fruit and vegetable juice and powder, starch, meat, chocolate and seaweed as printing materials.
To study the operation of 3D food printing and its possible applications and prospects.
A literature review was conducted through ScienceDirect, B-on and Pubmed databases using the keywords “3D printing”, “food”, “nutrition”, and “health” to target our research. Of the 1674 results obtained, 32 were selected based on their title, abstract and finally by full reading of the text. Only articles with a publication date of the last five years were selected.
3D food printing allows the customization of food design and its nutritional aspects, simplifying the food chain and the expansion of food material sources. The materials used for food printing in 3D must fulfil three requirements: printability, applicability, and suitability for post-processing. In addition, printing parameters such as nozzle speed, diameter and height, extrusion speed and internal fill percentage have a major influence on the precision and texture of the printed foods.
The technique is a promising technology that allows the creation of nutritionally personalized foods and increases the sustainability of the food chain by using foods of low interest and by-products. However, 3D printed food longevity and public acceptance are still major challenges.

Keywords: 3D printing; food; nutrition; health; food technology

SCHOOL AUDITORY SCREENING

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Introduction: Children with learning disorders have a prevalence of about 30% to 50% of hearing processing disorders, having presented at some point during its development, alterations in the auditory system. Therefore, school auditory screening should be a specialised succinct examination to contribute to a further diagnosis and better monitoring of the child. Objective: To highlight school hearing screening methods, as well as their importance, in order to prevent and identify children with hearing disorders that interfere with learning. Methodology: A search was carried out in the databases, Pubmed and google academic, with time period between 2012 and 2020 with search engines: "Hearing Loss", "Early Intervention", "Children", "School Hearing Screening". A total of 10 articles were obtained, 6 articles were excluded due to incompatibility with the objective of the study. Results: The main objective of the School Auditory Screening is to test all children at the audiological level. In addition to otoscopy, the main tests used are the pass/fail (hear/do not hear) and the tympanogram. This type of screening is essential for the identification of late or progressive hearing loss during childhood, important for the detection of the pathogenesis of the external and middle ear and the presence of obliterating cerumen in the CAE, or any other pathology that interferes with the child's school achievement. If the child fails screening should be referred for further evaluation, for medical follow-up and in some cases for Auditory Rehabilitation better adaptation at the educational level and a more effective intervention. Conclusion: School auditory screening should be performed as early as possible and is part of primary health care. This is also necessary for a careful clinical history and appropriate objective examinations, covering the general characteristics of the child.

Keywords: School Auditory Screening; Hearing Loss; Early Intervention; Children.

HEARING SCREENING IN FIRST CYCLE CHILDREN

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Introduction: Childhood hearing loss is a condition that affects children all over the world, regardless of socioeconomic background. Thus, the importance of monitoring by health professionals is stressed, since hearing loss may increase throughout an individual's life. The implementation of hearing screening programs enables the detection of and intervention in hearing pathologies, allowing the child to be (re)habilitated by hearing and consequently maximizing all his/her cognitive, physical and emotional potentialities, since the impact of hearing deprivation goes beyond the anatomical and physiological consequences.
Objective: The main objective of this work is to highlight and demonstrate the importance of early intervention for hearing loss in primary school children.
Methodologies: This study was carried out on March 25, 2022, based on scientific articles obtained in several electronic platforms such as PubMed, B-On, SciELO and Google Academic with the following words: "School Hearing Screening", "School-aged children", "Hearing Intervention", "Early Detection". Six articles were used from a total of eight, since they met the objective of the study.
Results: In school hearing screening, in addition to otoscopy, audiological evaluation is carried out with behavioural and objective tests, such as the flaw test and tympanogram.
Conclusion: By carrying out school hearing screenings it’s possible to detect any possible anomalies in the ear and in auditory processing. Early diagnosis in children can prevent academic failure and enable a better quality of life.

Keywords: “Hearing Screening”; “School-age Children”; “Intervention”; “Early Detection”.

AUDITORY NEUROPATHY

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Introduction: Auditory neuropathy is an auditory nerve damage that affects the ability to detect sounds and understand speech. Objective: This work aims to study Auditory Neuropathy and we will focus in the end of the work in a specific clinical case. Methodology: An analysis of several articles was performed between March 25 and April 5 on google scholar, using the keywords auditory neuropathy, causes, diagnosis, treatment and a period between 2000 and 2022 , based on the inclusion criteria, if the article correctly addresses the topic, if it does not allude to another pathology and if it was within the mentioned period. First, we analyzed the titles and abstracts, where 15 articles were chosen. Then, a complete analysis of the articles was carried out, leading us to 6 final article. Results: The patient reported that he listen the words, however, he is not able to understand them, demonstrating difficulties in understanding speech. He presents a light to severe sensorineural hearing loss in both ears with an unaltered tympanogram and absence of stapedic reflexes. He still has otoacoustic emissions, presenting abnormal results in the auditory brainstem response and normal results in the computed tomography of the temporal bones. It was observed, in the case studied, the incompatibility of results between pure tone audiometry and speech intelligibility tests, presenting hearing loss with important alteration in speech intelligibility tests. These data suggest normal cochlear function and altered neural synchrony. Conclusion: Auditory neuropathy is a diagnosis of exclusion when cochlear function tests are normal and auditory brainstem evoked potentials are greatly altered. The causes are multiple and so the rehabilitation plan will have to be adapted to each patient, and may include hearing aids adaptation or cochlear implant.

Keywords: auditory neuropathy, causes, diagnosis, intervention

PRESCHOOL AND SCHOOL-BASED HEARING SCREENING

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Introduction: A child with hearing loss who does not receive adequate re(h)abilitation and monitoring in the early years of education may develop disorders in the process of acquiring reading and writing that will have repercussions on lower school performance and secondary intellectual delay. In Portugal, until 2009, it was only recommended when a child entered basic education. Currently, due to the legislation on universality of preschool education, hearing screening could be carried out at 4/5 years old.

Objective: To know and inform about the pre-scholar and scholar hearing screening on a universal and national level.

Methods: We carried out a literature review through research on the Web of Science, Google Scholar, Audiology Associations sites, and books of audiology with the keywords “Hearing Screening”; “Audiology”; “Preschool and Scholar hearing screening” in English and Portuguese, after applying the exclusion criteria, 7 articles were selected, 10 rejecting because they are not compatible with the purpose of our study.

Results: The preschool and school-based hearing screening begins with otoscopy, tympanogram, and pure tone screening (pass/fail criteria) with the frequencies 1000, 2000, and 4000 at 20 dB HL. Should be used tympanometry in conjunction with pure tone screening in the young child population (preschool, kindergarten, grade 1) and when older children (>12 years) fail in the pure tone screening. The otoacoustic emissions (OAE) should be used only for preschool and school-age children for whom pure tone screening is not developmentally appropriate (ability levels < 3 years).

Conclusions: The preschool and school-based hearing screening should be performed as early as possible and be an integral part of primary health care, to guide the child towards appropriate intervention, education, and hearing follow-up.

Keywords: Hearing Screening; Audiology; Preschool and Scholar hearing screening

UNIVERSAL NEWBORN HEARING SCREENING

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Introduction: Hearing is fundamental to the development of children. Universal Newborn Hearing Screening (UNDS) is currently the best hearing screening method for early detection of hearing loss enabling timely intervention. The implementation of RANU programs is recommended, following the Joint Committee on Infant Hearing and the Group on Infantile Deafness Screening and Intervention (GRISI).
Objective: Emphasize the importance of the RANU in detecting hearing loss in the first months of a child's life.
Methodologies: A search was conducted in the "Scielo" databases and the "Google Academic" search engine, with the keywords "Universal neonatal hearing screening; deafness; newborns; hearing loss" where 16 articles were found.
Results: The main goal of RANU is to perform hearing screening tests in all children at birth, in case of confirmed hearing loss, early and appropriate intervention should be initiated. Two methods are used Otoacoustic Emissions and Automated Auditory Brainstem Response (A-ABR) because they are fast, non-invasive, and easily applicable in newborns. If the RANU fails, a diagnostic evaluation of hearing loss should be carried out with the help of professionals from various areas so that the child is offered all the means for its hearing (re)habilitation.
Conclusion: Identification of hearing loss and early intervention are essential to start the process of hearing (re)habilitation. The first step is screening programs like RANU to avoid the negative impact of hearing loss on child development.

Keywords: Neonatal Hearing Screening; deafness; newborn; hearing loss

OTOSCLEROSIS

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Background:Otosclerosis is a inflammatory disease of the temporal bone in which osteoclasts resorb the mature lamellar bone being this replaced by a bone with more thickness. Is an exclusive osteoarthritis from the optical capsule,is characterized by alterations in the bone remodeling, this results in the fixation of the footplate of the stirrup. It can cause different types of progressive hearing losses,like conductive and/or sensorineural hearing losses
Objective:Study etiological factors, clinical manifestations ,forms of diagnosis and treatment.
Methodology:A systematic review of the literature was performed, using the search strategy to identify studies that address Otosclerosis .Google Scholar electronic databases were consulted with the keywords “Otosclerosis”, “Etiology”, “Pathology”, “Inflammatory disease” and “Hearing loss”. According to the objective of the work, we obtained 10 articles, of which 9 were selected.
Results:Otosclerosis is a frequent cause of hearing loss. It can cause different types of hearing loss depending on the structure of the ear affected. From a clinical point of view, there is a progressive and usually bilateral hearing loss. Its etiology is currently not well defined. The diagnosis is made through a careful clinical history, clinical observation and complete audiological examinations.
Conclusion: The treatment should be discussed on a case-by-case basis, taking into account the patient's age, professional activity and degree of hearing loss. Treatment is generally surgical (stapedic surgery) with the aim of restoring hearing by removing an ossicle – the stapes – and replacing it with a piston prosthesis.

Keywords: “Otosclerosis”; "Etiology"; "Pathology"; “Inflammatory disease”; "Hearing Loss"

MÉNIÈRE'S DISEASE

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Introduction: Ménière's disease is a chronic pathology of the inner ear and is characterized by vertigo attacks, sensorineural hearing loss, tinnitus, and a sensation of aural pressure. Ménière's disease is related to an excessive accumulation of endolymph in the middle scale and vestibular labyrinths called endolymphatic hydrops.

Objective: Based on a literature review, we intend to study the characteristics of Ménière's disease through the patients' anamnesis and the results of tests such as tonal audiogram, vocal audiogram, and others.

Methodology: A systematic literature review was carried out and as a search strategy to identify scientific studies, the electronic databases b-on, PubMed, sciELO, Google Scholar, Web of Science were consulted, with the keywords "Ménière's disease", "vertigo syndrome", "endolymphatic hydrops" in English and Portuguese, after applying the exclusion criteria 17 articles were selected, rejecting 5 as they were not compatible with the object of study or when the time period was before 2002.

Results: The tonal audiogram of a patient with this pathology is characterized by unilateral sensorineural hypoacusis and in the low frequencies it presents an ascending curve. The hypoacusis generally does not exceed 50 dB HL, and in about 25 to 45% of the patients it is bilateral.

Conclusions: The pathophysiology of Ménière's disease is still not fully understood. Thus, the diagnostic criteria for this pathology are based on the patient's clinical information and a pure tone audiogram. The clinical information of the pathology is quite variable, which translates into diagnostic difficulty. Therefore, it is essential to carry out complementary examinations in order to obtain a good differential diagnosis.

Keywords: "Ménière's disease", "vertigo syndrome", "endolymphatic hydrops"

DETERMINANTS OF HEALTH AND HEALTHY LIFESTYLES - SMOKING, SEDENTARY LIFESTYLE, EATING HABITS

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In today's society a sedentary lifestyle is increasingly common, since people have started to move less and less in daily activities, spending many hours sitting and not dedicating time to regular physical activities, thus promoting a public health problem that has a direct influence on the health and well-being of the individual.

In order to determine the influence that an unhealthy lifestyle has on the health status of individuals a population survey was carried out. It was possible to verify that most of the respondents practice an unbalanced diet, with frequent consumption of sweets and fast food (27.3%), also associated with low water intake (45.5%). Furthermore, we verified that 83.6% of those who answered the survey were smokers and 98.2% coexist or have coexisted with someone who smokes.

It is also important to note that, despite all respondents saying that they are aware of the consequences of tobacco, 29.1% said that smoking helps to lower blood pressure, which is not true since smoking causes exactly the opposite. On the other hand, of the individuals who answered that they smoked, 55.6% do not think about quitting smoking, so we can verify that no effort is made on their part to fight addiction.

We can conclude that although people are aware of the effects that an unhealthy lifestyle brings to health, they are not committed to changing it, which is an aspect that needs to be changed.

Keywords: Sedentarism; Tabagism; Unbalanced diet; Physical activity

PUBLIC HEALTH IN A WAR CONTEXT

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War and armed conflict cause a significant loss of life and are a major cause of disability worldwide. Endemic poverty, malnutrition, economic/social decline and psychosocial illness are also some of the consequences. It inevitably reduces access to clean water, food and sanitation. This further increases the risk of contracting communicable diseases. Lack of access to clean water can also increase the prevalence of cholera and other diseases.

Our main goal was to demonstrate the impacts that war has, at all levels, as well as to express the importance of public health in this type of context.

The conception of this work included the analysis of several platforms such as the UN, UNICEF, Encyclopedia Britannica, and some scientific articles related to the subject under study.

To develop our study, we conducted a questionnaire to assess knowledge about the impacts of war and the role of public health.

From the survey of 46 respondents, we were able to find that in the question "Do you think Public Health is important in a war context?" the results obtained were positive so there was a majority (97.8%) in the answer "Yes" and only 1 negative answer (2.2%).

It is visible that the target population can see the need for these technicians in conflicts.

We can conclude that the role of the environmental/public health technician is very important in this context since it can prevent and reduce the risks of impacts that may have on the health of the population.

Keywords: Public Health, Environmental Health, War, Basic Needs

CLIMATE CHANGE: IMPLICATION FOR HEALTH AND THE ENVIRONMENT

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Climate change is variations in climate such as temperature, sea levels and precipitation that persist for a long time on Earth. The main causes of this event are mainly human activity such as the combustion of fossil fuels, but also natural phenomena. With this evolution, there will be an increase in the negative effects on public health.

This study aimed to develop the implications that climate change may have on global health, whether directly or indirectly, instantaneously or for a longer period of time. To carry out this work, several renowned scientific articles were used on the subject addressed and the application of a questionnaire that brings together questions on the subject.

In the survey applied, we observed that most people (80.2%) are aware of what climate change is and how it came about (60.3%). However, as expected, fewer people responded that climate change greatly affects human health (22.3%). We can also see that most people take basic steps to combat this problem such as turning off the tap while brushing teeth (82.6%) and recycling (78.5%) but fewer take more drastic measures such as reducing meat consumption (31.4%) or Carpool (5%).

Thus, as global warming is one of the main challenges of today and constitutes a threat to health, it will be important to invest in risk prevention and in ensuring population protection systems that are resilient to these changes.

Keywords: Climate change; Public health; Greenhouse effect; Environment

INFECTIOUS DISEASE

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Infectious Disease is understood as that caused by microorganisms, be they bacteria, viruses, parasites or fungi. It can be propagated between people or between people and animals. These are of great importance to public health because they are directly associated with poverty and inadequate living conditions.

This study aimed to understand the concept of infectious diseases and sensitize the population about it.

To develop this work, we used the research of scientific articles, and a questionnaire was applied to the general population.From the questionnaire we obtained 22 answers with the following results: more than 54.5% correctly answered the definition os infectious diseases; 68.2% mentioned direct contact with the infectious agent as a means of transmission, and all respondents mentioned at least one means of transmission of the disease; 68.2% reported cholera, followed by 40.9% diarrhea and then 31.8% toxoplasmosis, such as water and food borne diseases. Regarding respiratory diseases, 81.8% mention COVID-19.

Concerning the measures adopted to prevent diseases, 86.4% mentions hand washing and disinfection frequently and 72.7% reported keeping the space that inhabits clean. 90.9% respondents with pets, 60% reported taking them to the vet once a year. For the prevention of this type of diseases, we must take into account not only the mediums and nurses, but also the environmental health technicians and epidemiologists, because with their help is that we can prevent and take care of the health of the populations.

Keywords: Infectious Disease; People; Public Health

PUBLIC HEALTH AND AGING

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The biological aging process is progressive and universal, and there needs to be a constant review of the socio-economic measures of countries. With the completion of this work, it is intended to verify the safety conditions of the house, namely the area of residence, the area of residence, the existence of additional heating equipment and frequency of its use, the existence of fire extinguisher in the house, the occurrence of domestic accidents in the last 2 years, whether or not there are safety stairs in the buildings, physical exercise, whether the taking of medicines is correct, the areas of the house that are protected in order to avoid falls, injuries or any kind of damage and, finally, whether there is awareness that the phenomenon of aging in Europe is more and more accentuated.

According to the results and discussions, after the preparation of the questionnaire, it can be seen that domestic accidents (such as burns, falls, cuts) are the ones with the highest percentages, which makes everything more worrying. In relation to the practice of physical exercise, it is concluded that more than 50% do not practice any type of activity. We can see that in relation to the existence of additional heating equipment and safety stairs, the number of people who enjoy them is high. Therefore, we call for this to change in order to achieve a better quality of life.

It is concluded that there are several domestic accidents and little physical exercise that affect the health and quality of life of the elderly.

Keywords: aging, accidents, safety, elderly, physical exercise

RISK BEHAVIORS IN HIGHER EDUCATION

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The entrance to higher education is a complex path, in which there is a huge development of the university student, however, the student is not always psychologically and emotionally prepared. Risk behaviors specifically, the consumption of alcohol and other psychoactive substances in university students, make us reflect on the challenges, demands and changes implicit in the process of transition to this level of education. This study aims to verify and standardize the practice of risk behaviors in the academic population in order to contribute eventually to the future design of possible prevention/intervention strategies.

The use of a quantitative methodology, with a sample of 64 students and in the application of an instrument, an online questionnaire, allowed the characterization of the sample and the evaluation of more frequent risk behaviors.

With this study we can conclude that nowadays in higher education there is a large part of students who practice risky behaviors, such as alcohol intake frequently (about 92% eat at least 14 times a month), this being one of the most common risk behaviors, and also with regard to smoking, 47% of the population studied who smokes at least one cigarette within a month. On the more positive side, a strong adherence to the practice of physical exercise was recorded, and 84% of the unloved students practice physical activity.

In view of the existence of risky behaviours, such as the consumption of alcohol and other psychoactive substances, it is essential to use strategies to minimise this type of problem.

Keywords: Risk behaviors; Higher Education; Development; Adolescence; Prevention

COMPLICATIONS OF DIABETES: NEPHROPATHY AND DIABETIC FOOT

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Diabetes is a disease characterized by an increase in blood glucose levels. Glucose is the main source of energy for the cells that make up our body and is therefore extremely important for the functioning of our organism. Changes in glucose trigger a wide range of problems that can lead to several complications. Nephropathy and diabetic foot are some of these complications.

Diabetic nephropathy is a kidney disease that results from the damage caused by diabetes mellitus in both insulin-dependent and non-insulin-dependent people. It is a progressive disease that leads to functional decline of the kidney. It causes damage to the renal filter and, therefore, renal loss of protein in the urine. With the deterioration of glomerular filtration, chronic renal failure appears.

Diabetic foot is one of the most serious complications of diabetes. In this sense, prevention and treatment must be taken seriously by patients because, in the last case, the diabetic foot can lead to amputation.According to the who, it is a diabetic foot with infection, ulceration or destruction of the foot, caused by alterations of the nerves or vessels, caused by diabetes.

Keywords: Diabetes mellitus, nephropathy, diabetic foot, glomerular filter

ERYTHROPOIETIN – PHYSIOLOGY AND PATHOPHYSIOLOGY OF ABUSE

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Erythropoietin (EPO) is a glycoprotein hormone, mostly secreted by specialized cells in the kidney and to a smaller degree by the liver, which stimulates the production of erythrocytes in the red bone marrow (erythropoiesis). A decrease in circulating erythrocytes causes a consequent reduction in the oxygen levels (hypoxia). The lower oxygen levels trigger the synthesis of EPO and, therefore, stimulate erythropoiesis. The increase in erythrocytes, along with the associated increase in hemoglobin, improve the blood's oxygen carrying capacity, maintaining homeostasis. EPO is used for therapeutic purposes in cases of anemia, myelodysplastic syndromes, hepatitis C and bone marrow transplants, reducing the need for blood transfusions. Besides clinical applications, EPO can be used by athletes, although it is prohibited in sports, since the increase in erythrocytes associated with EPO improves an athlete's endurance and performance, providing them with an unfair advantage over others. This is due to the fact that EPO increases mitochondrial oxidative phosphorylation and the activity of the electron transport chain in muscle cells, increasing aerobic metabolism.

EPO can induce the production of Monocyte Chemoattractant Protein-1 (MCP-1), increasing the inflammatory process in artery walls. It can reduce arterial vasodilation by decreasing nitric oxide levels, causing endothelial dysfunction, an important factor in atherosclerosis and thrombosis, which can lead to pulmonary embolism and cardiac arrest. EPO may also cause hypertension, given that it induces vasoconstrictor substances, such as endothelin-1 and thromboxane-A2, and it is closely related to the decrease of the glomerular filtration rate, since it decreases reabsorption in the proximal tubules.

Keywords: Erythropoietin; Erythropoiesis; Side effects; Doping.

ASTHMA MECHANISMS AND FUNCTIONAL RESPIRATORY TESTS

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Asthma is a respiratory condition in which there is a production of antibody and other substances in response to an external antigen stimulus, such as histamine and slow-reacting anaphylaxis, which combined result in inflammation of the bronchial walls and an exaggerated production of mucus. This physiological response of our body will result in signs and symptoms such as dyspnea, respiratory noises, and coughing.

The diagnosis is made with respiratory functional tests, which consist of several non-invasive tests that allow the evaluation of different aspects of the respiratory system capacity, such as spirometry with bronchodilation test, tests to evaluate bronchial hyperreactivity, and also the evaluation of airway inflammation.

There are two major groups dividing the types of asthma, allergic and non-allergic, so the causes may vary depending on the group. Some of the causes for the allergic asthma group may be some environmental allergens such as dust mites, pollens, and irritants such as pollution, fumes, or strong smells. While for the non- allergic asthma group include sudden temperature changes or exercise.

In terms of treatment for asthma it will be very much about controlling symptoms and improving respiratory function. Medication includes B2 adrenergic agonists, anti-inflammatory drugs and leukotriene antagonists. In case of SOS they usually give bronchodilators (short-acting Beta 2 agonist). And also respiratory physiotherapy, with the goal of increasing expiratory flow.

Asthma prevention involves avoiding all causes that can develop asthma, especially as a fetus or baby. Cleaner, more airy environments can improve the risk of not having asthma by 5 times.

Keywords: Allergens, Asthma mechanisms, physiological response, respiratory physiotherapy, respiratory functional tests

REGULATORS AND COAGULATION CHANGES | VITAMIN K AND HEMOPHILIA

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Blood clotting is a complex sequence of chemical reactions that result in the formation of fibrin (fibrous protein) clot, culminating in the formation of a natural barrier to protect against bleeding. The formation of this clot is divided into the aggregation and coagulation phases. To simultaneously counteract excessive blood loss and prevent intravascular thrombus formation, regulation of this process is necessary. Vitamin K, responsible for this same regulation, is lipid-soluble, that is, it is transported by the blood linked to lipoproteins, such as triglycerides. Is synthesized by the bacterial flora of the intestine and can also be obtained from the diet. Vitamin K belongs to the group of lipophilic and hydrophobic vitamins and can be divided into K1, K2 and K3. Dietary vitamin K is absorbed in the small intestine, incorporated into chylomicrons (particles produced by intestinal cells) and transported through the lymphatic pathways, so a flow of bile and pancreatic fluid at normal levels is necessary for its correct absorption.

Vitamin K acts as a cofactor for the formation of y-carboxy glutamic amino acid present in coagulation factors II, VII, IX and X (essential for the conversion of prothrombin), allowing these factors to bind to calcium ions, thus enabling interaction with the phospholipids of platelet and endothelial cell membranes, which in turn promotes the normal blood clotting process.

Hemophilia is a chronic disease and a congenital dysfunction in the blood clotting process. Genetically linked to the X chromosome, it appears almost exclusively in males and is characterized by the absence or marked lack of one of the clotting factors. Alterations in the clotting cascade can cause 2 types of hemophilia: Hemophilia A (caused by the absence of factor VIII) and hemophilia B (caused by the absence of factor IX). Both types of hemophilia share the same symptoms and hereditary pattern, only blood tests can identify which factor is affected.

Treatment for this condition consists of injecting the missing factor.

Keywords: coagulation, regulation, vitamin K , dysfunction, hemophilia

HEMOPHILIA AND COAGULATION TESTS

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Hemophilia is a disease characterized by the inability to clot normally which causes people to have excessive bleeding.Hemophiliacs when they have a hemorrhage bleed for longer because the blood does not have the sufficient amount of clotting factors.

The inner wall of blood vessels (endothelium) contains a protein called collagen. When there is an injury and collagen is exposed, platelets are activated and will begin their function in the formation of the platelet buffer. However, when this is not enough, the coagulation cascade begins in which a blood clot is formed (transformation of liquid blood into a solid gel) that will strengthen the platelet buffer.

At the physiological level, hemophilia is characterized by the deficiency of one of the two blood clotting factors. If it is caused by factor VIII deficit it is type A, the most common, and if it is caused by a coagulation factor IX deficit, it is type B. The bleeding patterns and consequences of these two types of hemophilia are similar.

Hemophilia is caused by recessive alleles on chromosome X. Sometimes it appears without a family history due to a spontaneous mutation of the gene on this chromosome but, most often, it is hereditary,being, the main affected men since they have only one X chromosome.

Clotting tests measure your blood's ability to clot and how long it takes to do so. Some examples of these tests are prothrombin time and partial thromboplastin time.

Keywords: Hemophilia; Coagulation; Clotting tests

RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM / ACE INHIBITORS AND AT1 RECEPTORS

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The renin-angiotensin-aldosterone system (RAAS) is important in regulating blood pressure. When blood pressure decreases in the afferent arteriole, the granule cells of the kidney produce renin, which is released into the bloodstream and will cleave angiotensinogen to angiotensin I. In turn, angiotensin I is cleaved by ACE (angiotensin converting enzyme) and converted into angiotensin II, which acts at the level of the adrenal cortex promoting the release of aldosterone and at the level of the hypothalamus releasing ADH (antidiuretic hormone). Aldosterone and ADH act on the collecting duct and increase sodium and water reabsorption, increasing blood pressure. Angiotensin II has two receptors, AT1 and AT2. When bound to AT1 it causes vasoconstriction and tubular reabsorption that increase blood pressure. But when bound to AT2 it has a vasodilating effect.

Hypertension is due to the excess activity of this system or its malfunction. To regulate it, ACE or angiotensin II (AT1) receptors can be blocked. ACE inhibitors interfere with the conversion of angiotensin I to angiotensin II and through the inhibiting of the degradation of bradykinin (vasodilator). AT1 receptor inhibitors block the binding of angiotensin II to its receptors, stimulating AT2 receptors that are responsible for vasodilation and consequent decrease in blood pressure.

Keywords: renin, angiotensin, aldosterone, blood pressure

NON-ALCOHOLIC FATTY LIVER DISEASE, CHOLESTEROL METABOLISM AND STATINS

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Non-alcoholic fatty liver disease is defined by the accumulation of extra fat in the liver cells, not being alcohol consumption its cause. Cirrhosis is related to this disease, and can be caused by it, being a chronic liver disease characterized by the development of fibrosis. Fibrosis, in turn, is the formation or development of stromal cells (connective tissue) in certain tissues or organs, as in the case of the liver.

Cholesterol synthesis takes place in four phases and is a process that takes place in the cytosol and endoplasmic reticulum from acetyl-CoA. In the first, acetyl coenzyme A is converted into mevalonate. In the second phase, the conversion of mevalonate into activated isoprenoid units occurs through the addition of three phosphate groups to the mevalonate, from three molecules of ATP. In the third phase, squalene (C-30) is formed, through the condensation of six isoprenoid units (C-5), and in the fourth and final phase, squalene is cyclized to form the four rings of the cholesterol steroid nucleus. This will then be transported in the blood by lipoproteins.

Statins are lipid-lowering agents, that is, they are drugs used in the treatment of dyslipidemias, which are characterized by abnormal levels of lipids in the blood. They work by inhibiting HMG-CoA reductase, which is the key enzyme in the synthesis of cholesterol, which causes a reduction in LDL cholesterol (bad cholesterol). Thus, they play a key role in controlling this disease.

Nonalcoholic liver disease has a good prognosis but has no cure. The physiotherapist has a key role in the treatment of impaired muscle and respiratory function that may result from this.

Keywords: liver, Statins, cholesterol metabolism, acetyl-CoA

WHITE AND BROWN ADIPOSE TISSUE, ENDOCRINE FUNCTION OF ADIPOSE TISSUE IN OBESITY

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Adipose tissue is a type of connective tissue that has specialized cells called adipocytes, which are characterized by having fat in their cytoplasm. It performs important functions such as: energy reserve, protection, thermal insulation, support of internal organs and secretion of substances such as leptin (inhibits appetite and decreases food intake).

Humans have two different types of adipose tissue: white adipose tissue (WAT) and brown adipose tissue (BAT), which are morphologically, molecularly and functionally distinguished.

White adipose tissue cells are large and have a single drop of fat, formed by the fusion of numerous droplets, which stores triglycerides (molecules responsible for energy reserve) from the liver or food.

Brown adipose tissue cells are smaller, have several triglyceride droplets of different sizes, relatively abundant cytoplasm, and numerous mitochondria. It has the ability to produce heat because their mitochondria lack the enzyme complex necessary for ATP synthesis and use the energy released mainly from fatty acids for thermogenesis.

Excessive accumulation of white adipose tissue leads to obesity and its associated metabolic health consequences such as type 2 diabetes and cardiovascular disease. Brown adipose tissue activates and generates heat to maintain body temperature, increasing energy expenditure without the need for exercise.

Keywords: adipose tissue, adipocytes, leptin, brown, white

AUTOIMMUNE DISEASES

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The immune system protects the body from external microorganisms, through antibodies that recognize and destroy invaders. In autoimmune diseases, antibodies attack the body's own cells, tissues and organs.

Autoimmune diseases can affect the nervous, digestive and respiratory systems, the skin and the blood. There are several triggering factors that interfere with the development of an autoimmune disease: bacteria, viruses, toxins, hormones, stress and drugs. Patients with autoimmune diseases may have some non-specific signs and symptoms, such as pain and swelling in the joints, fever, red spots on the face, decreased strength or sensitivity in the extremities, but each autoimmune disease is very different.

There are more than 100 types of autoimmune diseases such as: rheumatoid arthritis, where the immune system cells attack the joints, causing inflammation, swelling and can gradually cause permanent joint damage and chronic joint pain; multiple sclerosis, where the immune system attacks nerve cells, causing various symptoms (pain, vision loss, muscle weakness, lack of coordination and muscle spasms); lupus, where the immune system attacks its own cells causing inflammation and tissue damage; Guillain-Barré syndrome, where the immune system attacks the nerves that control the leg muscles and sometimes the upper body, such as the muscles needed for breathing.

The treatment of autoimmune diseases consists of inhibiting the immune system through immunosuppressive drugs, such as corticosteroids. It is not possible to inhibit only the function of harmful antibodies so a state of general immunosuppression is created, which predisposes these patients to infections by bacteria, viruses and fungi.

Keywords: Autoimmune, immunity, antibody, immunosuppression, diseases

DEVELOPMENT OF A NUTRITIONAL POLICY TO COMBAT FOOD INSECURITY IN THE AUTONOMOUS REGION OF THE AZORES

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Introduction: Food insecurity (FI) is characterized by limited, uncertain and sometimes insufficient access to nutritionally balanced food suited to individual nutritional needs. According to the IAN-AF 2015-2016, the prevalence of food insecurity showed the highest values in the Autonomous Region of the Azores (ARA), being higher in vulnerable families.
Aim: To develop and implement a nutritional policy in order to reduce food insecurity and improve health literacy in the RAA.
Methodology: For the diagnosis of the situation, documents were analyzed, namely IAN-AF 2015-16, PNPAS, React Covid and Infofamília. The complementary literature review was conducted in Pubmed and Google Scholar using the keywords “food insecurity”, “Azores”, “nutritional policy” and “atlantic diet”, for the development of this policy.
Results: This policy will be implemented between 2022-2028 and has four axis: improve availability, access, food supply and promote the circular economy, promote nutritional literacy, promote adherence to the Atlantic dietary pattern (AD) and promote physical activity. In this way, several actions were developed for each axis. For the execution of the different tasks, partnerships would be established with different stakeholders such as municipalities, nutritionists, schools, restaurants and community associations, local producers and food stores. The main implementation sites include schools, public infrastructure and outdoor spaces.
Conclusion: It is expected an improvement in food supply and consequently in a decrease in the prevalence of food insecurity, an increase in health literacy and adherence to AD and consequently an improvement in nutritional status and quality of life, in 20% of this population.

Keywords: "food insecurity", "azores", "nutritional policy", "atlantic diet"

Discipline: Nutritional Policy

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Degree: Dietetics and Nutrition

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DEVELOPMENT OF A NUTRICIONAL POLICY TO MITIGATE OBESITY IN THE AUTONOMOUS REGION OF MADEIRA

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Introduction: According to studies, diseases of the circulatory system are the main cause of death in the Autonomous Region of Madeira (RAM). In 2019 these diseases caused 797 deaths, which has increased year after year. This fact may be related to the fact that this region has a high prevalence of overweight and obesity. It is also verified that the national prevalence of 'regular' practice of physical activity is 41.8%, being lower in the Autonomous Region of Madeira (33.1%).
Objective: Develop a nutritional policy in the RAM to prevent and reduce the prevalence of obesity in the population and consequently reduce the incidence of diseases of the circulatory system.
Methodology: For the literature analysis, statistical documents and surveys in the health area in the Autonomous Region of Madeira were used. Five documents were analyzed, including the IAN-AF 2015-2016 and the COSI Portugal 2019. A nutritional policy was developed through strategies and actions based on the data obtained.
Results: Strategies were defined based on three axes: increasing nutrition literacy, promoting physical exercise and disseminating the principles of the Mediterranean diet and healthy eating. The implementation of the actions will take place for five years. Partnerships will be developed with municipalities, the regional government, IPSSs, schools and local businesses.
Conclusion: It is expected that the nutritional policy applied proves to be effective in reducing the prevalence of obesity and, in turn, in the lower incidence of diseases of the circulatory system.

Keywords: “obesity”, “Autonomous Region of Madeira”, “circulatory system diseases”, “health”, “epidemiology”

PROPOSAL FOR A NUTRITION POLICY IN THE AUTONOMOUS REGION OF THE AZORES

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Introduction: The Autonomous Region of the Azores (ARA) presents a high prevalence of obesity and hypertension. These problems result as a consequence from an exaggerated consumption of red meat, dairy products and saturated fats and from a low intake of fruits and vegetables. This is also the second region of Portugal with the highest food insecurity (44.5%).

Objective: Implementation of a regional nutrition policy that aims the reduction of the incidence of these chronic diseases in the Azorean population.

Methodology: A review was carried based on the existing bibliographic data in IAN-AF, INSEF, IRSA and DGS. The constructed policy is aligned with the national and european guidelines.

Results: The policy to reduce obesity and hypertension is based on 3 axes: encouragement of the adoption of a healthy diet, improvement of food literacy and decrease of food insecurity. To this end, measures have been created for each of the axes, which are focused on schools, local authorities, local markets, health centers and the community. Strategic partnerships have also been established with the food sector. The prevalence of obesity and hypertension is expected to decrease by 5% and 3%, respectively, in a period of 5 years.

Conclusion: The developed Nutrition Policy will promote behavioral changes in the population, contributing to the improvement of the prevalent health problems in the ARA.

Keywords: nutricional politics, Azores and Regional politics

COLORECTAL CANCER IN CENTRO REGION: DEVELOPMENT OF A NUTRITIONAL POLICY

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Introduction: Colorectal cancer is one of the main causes of death in Portugal, with the Centro region being the area with the highest incidence. This tumour develops in the large intestine, and its main risk factors are ageing, family history, previous history of colorectal cancer or other types of cancer and inflammatory bowel disease. In addition, lifestyle also has a major impact, namely excessive consumption of red and processed meats, fats and low fibre intake.

Aim: To develop a nutritional policy for the Centro region to reduce the incidence and mortality of colorectal cancer.

Methodology: This policy was developed through the analysis of documents such as “Perfil Nacional de Saúde 2021-2030”, “Perfil Regional de Saúde - Região Centro” and from scientific databases such as “Pubmed”.

Results: This policy will last one year and is based on three axes: raising public awareness of the pathology and its screening, promotion of a healthy lifestyle and intervention in the food industry. For each axis a set of activities was developed in order to achieve the defined objectives. In addition, partnerships were established with municipal councils, parish councils, ARS Centro, health centres, hospitals and pharmacies of the locations covered by the intervention, so that the activities can be applied and reach the largest number of individuals.

Conclusion: It’s hoped that the implementation of this nutritional policy will result in an increase in knowledge about the disease, a decrease in its incidence and mortality and, in general, an improvement in quality of life.

Keywords: Centro region; Colorectal Cancer; Nutritional Policy

NUTRITIONAL POLICY FOR CHILDHOOD OBESITY IN NORTHERN PORTUGAL

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Introduction: Childhood obesity is considered by the World Health Organization as one of the biggest public health problems in the world, being currently the most prevalent nutritional disease in developed countries. Its prevalence in the northern region of Portugal, according to COSI 2019 data, is between 28% and 31%, being the highest in the country.
Objective: to define a nutritional policy to combat childhood obesity in the North region.
Methods: Nutritional problems were identified and strategies were defined through research in DGS, INSA, COSI and PNPAS reports, as well as in the GoogleScholar database. The research carried out was fundamental for the development of the nutritional policy.
Results: It is intended to implement a nutritional policy in basic schools in the northern region of the country, in order to combat childhood obesity. The policy will take place over a period of 2 academic years (2023 to 2025) and is based on 3 axes: improving the nutritional status of adolescents, raising awareness among parents and training the school community. Partnerships will also be established with municipal councils, parish councils, gyms and other companies, in order to carry out the activities. Several activities should still be explored in this region to combat this problem.
Conclusion: With this nutritional policy, we hope to reduce the prevalence of childhood obesity in the North, increasing the awareness of the school community and parents, as well as enhancing the knowledge and practice of healthy lifestyles in adolescents.

Keywords: Childhood obesity; Nutritional Policy

IMPLEMENTATION OF NUTRITIONAL POLICY IN ADULT POPULATION OF THE ALGARVE REGION

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The adherence to the Mediterranean Eating Pattern is associated with low rates of mortality and morbidity by reducing incidence of cardiovascular diseases, obesity, type 2 diabetes mellitus, hypertension and cancer, hence, to a better quality of life. In the Algarve region, the percentage of high adherence to the Mediterranean diet was lower than the national average. Thus, the promotion of the Mediterranean diet requires a more targeted intervention to increase availability and access, therefore acting on the main obstacles to its adherence.

The objetive was create a nutritional policy for the Algarve region that contributes to reduction of identified problems.

Were analyzed sites such as “PORDATA”, “The National Statistics Institute” (INE), ““Ata Portuguesa de Nutrição” and “Nutrimento” and documents such as the National Program for the Promotion of Healthy Eating 2020, these being necessary for the development of the nutritional policy.

This policy is based on two axes: early diagnosis of population and awareness and reeducation for healthier habits namely by increasing adherence to the Mediterranean diet in the Algarve region. In order for this information to reach the largest number of people it was necessary partnerships with city councils, municipalities, parish council, supermarkets and universities in the locations covered by the intervention of one year.

In view of the strategies that will be taken, it is expected that the implementation of the nutritional policy will result in an improvement of healthier habits by increasing adherence to the Mediterranean diet and the global health conditions in this region.

Keywords: "Algarve"; "Mediterranean Diet"; "Nutritional Policy;"

DEVELOPMENT OF A NUTRITIONAL POLICY IN LISBOA E VALE DO TEJO

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Introduction: Diabetes is a major problem at national level, and in Lisboa e Vale do Tejo it's the fourth most registered pathology with 7.1% of active diagnoses. This disease develops due to several years of unhealthy lifestyle habits, especially the excessive consumption of carbohydrates in the diet and a sedentary lifestyle.
Objectives: Develop a nutritional policy to reduce the incidence of type 2 Diabetes Mellitus.
Methods: A review was carried out based on data from the existing bibliography in the 2018 Health Portraits, 2018-2020 Regional Health Plan, PORDATA and Annual Report of the National Diabetes Observatory 2019 to develop the policy.
Results: Our performance will be held from the beginning of 2023 to end of 2028 and will be based on three main axes: screening and diagnosis, promotion of food literacy and changes in lifestyle. Therefore, our interventions will be carried out for the general population, with the main focus on risk groups and the school community. The implementation of these actions will take place in municipal councils, school groups and health centers in the Lisboa e Vale do Tejo region.
Conclusion: With the implementation of this nutritional policy, a reduction in the incidence of type 2 Diabetes Mellitus and an increase in literacy is expected.

Keywords: “diabetes”; “food literacy”; "obesity"; "LVT"

NUTRITIONAL POLICY FOR ADULT OBESITY IN THE NORTH OF PORTUGAL

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Introduction: Obesity is characterized by the excess of accumulated body fat that may enhance the development of other chronic diseases. In the North of Portugal this is a serious public health issue that has higher incidence in females (14.4%) than males (10.2%).
Objective: To develop a nutritional policy that applies in the north in order to combat the obesity prevalent in this region.
Methods: The literature review was made in statistical documents and health surveys of the northern region of Portugal, such as the Health Profiles of the various regions, released by the groups of health centers of the Western and Eastern Porto, Famalicão, Gaia, Espinho, Póvoa de Varzim and Vila do Conde and also the document "Retrato da Saúde 2018" by the SNS, which worked as a base to elaborate our policy.
Results: Our policy will be implemented on 3 axes: promote the practice of regular physical activity, healthy eating habits and food education. These measures will be implemented in the population over 40 years old with obesity in the northern region, in order to reach a larger audience, in partnership with different entities. The implementation will be at the beginning of 2023 ending in 2025.
Conclusion: Through the development of this policy, it´s intended to achieve a positive impact on obesity, to reduce its' complications and numbers of cases of morbidity and mortality. Thus, it is necessary to sensitize the population to adhere healthier lifestyles.

Keywords: "Obesity", "North", "Measures" and "Solutions

NUTRITIONAL POLICY IN THE ADULT POPULATION OF THE ALENTEJO REGION

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Introduction: In the Alentejo region, 75% of the population in the 65-74 age group have a high rate of overweight and obesity. It is also observed the development of diseases such as hypertension and diabetes, besides problems related to low socioeconomic status, sedentary lifestyle and excessive consumption of alcohol and tobacco.
Objective: To develop a nutritional policy for the Alentejo region that contributes to reduce the identified problems.
Methodology: A literature review was conducted in references such as DGS, Ian.af and PeRS Alentejo which allowed the development of the nutritional policy.
Results: The nutritional policy will be developed between 2023 and 2025 and will be based on three axes: population awareness; education and food literacy; and promotion of physical activity. To reach the largest number of people, partnerships have been established: municipalities, city councils, parish councils, health centers, as well as restaurants and local producers in the locations covered by the intervention. Some activities were defined to facilitate the approach of health professionals to the community, namely a van with the integration of a multidisciplinary team to reach the isolated citizens.
Conclusion: With the implementation of the nutritional policy based on the above strategies, it is expected that there will be an increase in knowledge and an improvement in eating habits, as well as a decrease in the rate of obesity and associated comorbidities and an increase in physical activity among the adult population in this region.

Keywords: Adult; Alentejo; Obesity; Nutritional Policy.

DEVELOPMENT OF NUTRITIONAL POLICIES IN THE POPULATION OF THE ALGARVE

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Introduction: Hypertension is characterized by an excessive blood pressure on the artery wall, above the values considered normal, which occurs chronically. In the Algarve, there is a high prevalence of patients with hypertension, and this population has a higher risk of death or development of certain diseases, such as heart failure and myocardial infarction.
Objectives: To develop a nutritional policy, associated with the Mediterranean diet, aimed at reducing the incidence of hypertension, based on the TC values in the Algarve population.
Methods: A survey was carried out through socio demographic surveys to analyze the main weaknesses of the population, using the INSEF 2015 and National Health Survey 2019 surveys. Regarding policy development, we analyzed programs and campaigns already implemented.
Results: The intervention is aimed at the general population and is based on 3 axes: improvement of the food supply, training and food literacy. The activities chosen for this intervention include improving the food supply in canteens, school/business bars in partnership with municipalities, companies, among others. As well as the qualification of cooks and food handlers who work in the aforementioned establishments. Finally, it is intended for a period of nine months, to hold workshops in schools/companies, create informative posters, among others.
Conclusion: We intend to appeal to the importance of adopting healthy eating habits in order to reduce hypertension and associated chronic complications by favoring a diet based on the Mediterranean dietary pattern.

Keywords: “Algarve”, “HTA” and “Nutritional policy”

THE BENEFITS OF KOMBUCHA IN THE INTESTINAL MICROBIOTA

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Kombucha tea is fermented food defined as a beverage obtained through the fermentation of sugared tea infusion by the action of a Symbiotic Culture of Bacteria and Yeast. Due to multiple bioactive compounds released during fermentation, Kombucha has become one of the most promising fermentative products due to its potential health benefits for the intestinal microbiota. Understanding the benefits of kombucha consumption on the intestinal microbiota. A Literature review was conducted in PubMed, ScienceDirect, and Google Scholar databases from March to April 2022. After title and abstract analysis of 67 articles, it was selected 40, and from that, after full reading, it was included in this study 25 articles. This research was restricted to articles published in the last 5 years using the following keywords: “Fermented Foods”, “Kombucha”, “Microbiota”, and “Health Benefits”. The bacterial species such as Acetobacter, Bacillus and Starmerella found in Kombucha and other bioactive compounds such as probiotics and polyphenols form a symbiosis with beneficial strains in the human gut, including a nonspecific mechanism to inhibit the growth of pathogenic bacteria in the human gastrointestinal tract. Kombucha is considered safe for consumption as long as it is produced properly and ingested in moderation.

The dominance of yeast and bacterial strains in Kombucha and their crosstalk are essential for their bioavailability in providing benefits to the healthy human gut. Future studies must have longer intervention periods in which gut microbiota must be monitored to understand better the long-term effects of fermented foods consumption on human health.

Keywords: “Fermented Foods”, “Kombucha”, “Microbiota”, “Health Benefits”

RELATIONSHIP OF ERYTHRITOL INTAKE WITH THE APPEARANCE OF DENTAL CARIES

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Introduction: Excessive sugar consumption in the diet results in numerous health-related concerns. That said, there has been an increase in low-calorie sweeteners as an alternative. Erythritol, a natural sugar alcohol found in some fruits and fermented foods, is used as a sweetener in beverages, tablets, gums, chocolates, ice cream, and others. It acts as a caries inhibitor with xylitol due to its humectant function and its non-carcinogenic properties.

Objective: To analyse and understand the relationship between erythritol intake and the appearance of dental caries.

Methods: Science Direct and Pubmed platforms were used for the literature review, with the keywords “Nutrition”, “Toxicology”, “Erythritol” and “Dental caries”. The 25 articles were selected considering their relevance and temporal space, which was limited to 5 years.

Results: Sweeteners can be classified by origin or by their intrinsic properties. Some of the most common classifications are based on their nutritional value and sweetening power. Several studies have shown that erythritol effectively caused decreased plaque and adhesion of common bacteria to tooth surfaces, decreased expression of bacterial genes involved in sucrose metabolism, and reduced the overall incidence of dental caries.

Conclusion: Erythritol may be important as a preventative oral care strategy to help maintain oral health, as well as dietary based, since as it does not contribute energy, it may be a strategy used in weight control.

Keywords: Nutrition, Toxicology, Erythritol and Dental caries

AVENA SATIVA: SUPERFOOD?

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Introduction: *Avena sativa* L. is a good source of high-quality proteins, carbohydrates, dietary fiber such as β-glucan and soluble dietary fiber, fats, minerals, phenolic acids, flavonoids, antioxidants and avenanthramide. Thus, presenting several beneficial effects on health, namely obesity, kidney disease, diabetes, gastrointestinal complications, cognitive function, inflammatory diseases, oxidative stress, carcinogenic activity and cardiovascular diseases.
Objectives: Understand the impact of *Avena sativa* L. consumption on human health.
Methods: A literature review was carried out in Pubmed, Sciencedirect and B-on databases using the following keywords "*Avena sativa*", "nutrition", and "health". Initially, 307 articles in English and Portuguese published in the last five years were obtained and, subsequently, analyzed, first by title, then by reading the abstract. After reading the full text, we selected 25 articles.
Results: *Aveia sativa* belongs to the group “Cereals and Derivatives and Tubers” of the Nova Roda dos Alimentos in which the recommended serving consumption is 4-11 servings, with a serving of oat equivalent to 30g.
A high consumption of *Avena sativa* is associated with a lower risk of type 2 diabetes, obesity, kidney failure, decreased risk of cancer, increased cognitive function and increased gut microbiota. There is no solid evidence concerning cardiovascular and inflammatory diseases.
Conclusion: Although the benefits of *Avena sativa* are not solid in all the pathologies, their nutritional interest is clear due to their biochemical compounds and their benefits for human health. Thus, the incorporation of oats into the diet is widely recommended.

Keywords: "*Avena sativa*"; "nutrition"; "health"

GALACTOOLIGOSACCHARIDES: ARE THERE EFFECTS ON THE HUMAN MICROBIOTA?

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Galactooligosaccharides (GOS) refer to a group of non-digestible oligomeric carbohydrates produced from lactose. These can come from food, mainly from fruit and vegetables, or obtained through supplementation of, for example, dairy products, infant formulas and bread. GOS is also considered a prebiotic with beneficial effects for the host, namely through the modulation of the intestinal microbiota, directly correlating with the health-disease status.

This literature review aims to understand how GOS can influence the intestinal microbiota. It was carried out in the Science Direct, Pubmed and Google Scholar databases, using the keywords "galactooligosaccharides", "effects", "microbiota", and "health". In the time interval from 2017 to 2022, 25 articles were selected and analyzed.

It was found that GOS has benefits in promoting the growth and/or activity of probiotic bacteria. The action of GOS on the intestinal microbiota can be done by decreasing pro-inflammatory cytokine responses or by increasing the absorption of minerals and protecting the intestinal barrier due to antibacterial properties. The fermentation of prebiotics produces short-chain fatty acids with immunomodulatory properties, affecting the colon's pH, contributing to a change in the composition and population of the intestinal microbiota, consequently modifying the faecal composition, preventing constipation. The recommended dose of GOS for beneficial effects varies between 5 to 11g, administered for at least three weeks.

This study allowed the understanding of the positive effect and relationship, according to the dose, between GOS inclusion in the diet and the intestinal microbiota modulation.

Keywords: "Galactooligosaccharides"; "effects"; "microbiota"; "health"

ARE THERE BENEFICIAL EFFECTS TO HEALTH REGARDING CAMU-CAMU CONSUMPTION?

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Introduction: Camu-Camu (*Myrciaria dubia*) is a fruit recognised for its rich vitamin C and bioactive compounds such as anthocyanins, flavonoids, phosphorus and carotenoids. The processing of by-products has a strong potential for the food industry, allowing its economic valorisation.
The composition and mobilisation of the reserves of this fruit are fundamental for the technology of products.
Objective: To know the biochemical components of Camu-Camu and understanding its health effects.
Methodology: A literature review of several articles was performed on PubMed, ScienceDirect and Google Scholar using the keywords "Camu Camu" and "*Myrciaria dubia*" since 2017, resulting in 8945 papers, of which 25 were selected.
Results: The fruit's by-products (peel, seeds and pulp) showed great nutritional interest between the components and effects produced. Namely, vescalagin, castalagin, gallic acid and procyanidin confer an antioxidant effect. Galloylated proanthocyanidins confer hypolipidemic and hypoglycemic effect. Triterpene betulinic acid (70ml/day of juice) shows an anti-inflammatory effect. Gallic acid and 2,5-dihydroxybenzoic acid have shown antiproliferative. Methylvescalagin confers the anti-parasitic effect and vitamin C neuroprotective and immunomodulatory effect.
Conclusion: The components of Camu-Camu fruit and its health effects were known through this research. However, more studies are needed so commercialisation can expand and be applied in citizens' daily lives.

Keywords: Camu-Camu, *Myrciaria dubia*, antioxidant, phenolic compounds

MIRACULIN: A NATURAL SWEETNER

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Introduction: High sugar intake is the main factor associated with excessive energy intake and the development of obesity and several chronic diseases, namely, type 2 diabetes and cardiovascular diseases. Thus, the demand for alternative, non-artificial sweeteners has been increasing. One of these is miraculin, a flavour-modifying protein found in the fruit of the miracle fruit plant (*Synsepalum dulcificum*).
Objective: Study miraculin and its properties as a natural sweetener.
Methods: Literature research was carried out in PubMed and ScienceDirect databases, with the keyword miraculin and in a time interval of 10 years, which resulted in 69 articles (1 and 68, respectively). The papers were selected after the title, abstract and full-text analysis, with 26 articles used to elaborate on the article.
Results: Miraculin acts on taste cell membranes near the sweet receptor site, producing the sweet sensation. Its effect consists of converting sour flavours into sweet ones. It has a sensory profile similar to that of sucralose, a consecrated and recognized sugar substitute, and lasts until it is diluted and eliminated by saliva. Its action depends on pH and temperature, reduced at high pH and greatly reduced at pH above 12 or below 2.5 and at elevated temperatures.
Conclusion: Miraculin has the nutritional quality and pharmacological actions, a good substitute for sugar in acidic drinks. Future studies are still needed on other products that assess consumer perception.

Keywords: Miraculin, sweetener, nutrition, food toxicology

RAMBUTAN: A NEW POTENTIAL FRUIT?

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Introduction: Rambutan (*Nephelium lappaceum* L.) is a tropical fruit belonging to the Sapindaceae family, widely cultivated in Southeast Asian countries. This fruit has a high content of proteins, antioxidants and phenolic compounds. As the processing produces a significant amount of peel/seed residues, it is essential to use these residues in industrial applications and in supplements to combat waste and maximize utilization.
Objective: To analyze the dosage of the fruit supplement, as well as the benefits/harms to ascertain if it should be recommended.
Methodology: A literature review was conducted on PubMed and ScienceDirect, within the last 5 years. Were obtained 3650 articles and 25 were selected after reading the title, abstract and integral text.
Results: Phenolic compounds are responsible for anticancer and apoptotic activity. In rats, the 5000 mg/kg body weight (bw) oral administration showed no toxic signs or mortality, although above 5000 mg/kg bw, a letal effect was observed. After the daily oral administration of 312 and 625 mg/kg bw, the rambutan peel phenolic (RPP) extract showed no obvious toxicity. Administration of 2500 mg/kg bw of RPP extract may be toxic to liver tissue and cause liver damage.
Conclusion: Rambutan has great potential to be used in several areas, such as pharmaceuticals, cosmetics and food. However, one of the limitations of this study is the lack of studies on humans. Therefore, the development of new studies can contribute to the improvement of the knowledge in this field.

Keywords: "effects"; "*Nephelium lappaceum*"; "powder"; "rambutan"; "supplement".

HEALTH IMPACT OF CARBOXYMETHYL CELLULOSE

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Introduction: Carboxymethyl cellulose (CMC) is a water-soluble polysaccharide derived from cellulose, added to foods as a stabilizer, emulsifier, thickener, humectant, binder, gelling and coating agent. It's a food additive, classified as E466 in Europe, which the acceptable daily dose isn't specified. CMC has a wide range of applications, such as extending the shelf life, preserving quality and improving the characteristics of products.
Objective: To study CMC's toxicity and the extent of its impact on human health.
Methods: A literature review was performed in Pubmed and Science direct databases, using the keywords "Carboxymethyl cellulose AND Cellulose gum AND Nutrition AND toxicity AND emulsifier". The results, published in the last ten years, were first analyzed by title, abstract, and full-text reading.
Results: Studies have been conducted in different animals, showing that CMC could alter the gut microbiota, promote gout inflammation and obesity, and impair glycemic control. Another study assumes that CMC is neither hematotoxicity nor hepatotoxic.
Despite the lack of extensive safety testing, CMC has been approved for use in food in concentrations up to 2% by regulatory agencies. CMC is presumed to be safe as it's not well absorbed and is mostly eliminated in faeces. However, such passage through the gut allows it to interact directly with the gut microbiota, which may contribute to the increased incidence of chronic inflammatory diseases.
Conclusion: Although most studies report that CMC isn't toxic, for its safer use, it's necessary to analyze its toxicological effects more thoroughly and to assess its risks to human health accurately.

Keywords: Carboxymethyl cellulose AND Nutrition AND toxicology

SUCRALOSE: IS IT HEALTHIER THAN SUGAR?

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Background: Sucralose is a non-caloric sweetener derived from sucrose widely used in food and beverages. It is 600 times sweeter than sucrose, and the organism does not metabolize it as an energy source.
Objective: To understand the effects of sucralose on human health.
Methods: A literature review was conducted in the databases Science Direct, B-on and Google Scholar with the keywords “sucralose”, “toxic”, “nutrition”, “health”, and “food” with the articulator ”AND”, resulting in a total of 1223 articles. From these results, 26 were selected based on their title, abstract and finally by full reading of the text.
Results: The sucralose effect in health is controversial. It has been described that sucralose can increase insulin resistance, even though other studies refer that it doesn’t affect glucose homeostasis. Regarding the microbiome, it has been stated that it lowers the intestinal beneficial bacteria. It also has been used in obesity as a low-calorie alternative to sugar, however, some studies mention that it promotes fat accumulation. The safe daily dose of sucralose recommended by World Health Organization is 0-15mg/kg. Still, some studies defend that this should be revised and maybe reformulated to prevent toxicity.
Conclusions: There is no consensus about the effects of sucralose on health in the scientific community, therefore the aim of this study wasn’t totally obtained. More studies are needed.

Keywords: “sucralose”, “toxic”, “nutrition”, “health”, and “food”

INFUSIONS OF *CAMELLIA SINENSIS* FOR PHYTOTHERAPEUTIC TREATMENT OF DIABETES MELLITUS TYPE 2 - WHAT IS THE DOSE?

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Introduction: Type 2 Diabetes Mellitus (T2DM) is a chronic endocrine and metabolic disease characterized by abnormally high blood sugar levels, due to a failure in the pancreas to produce insulin or when the body cannot use insulin efficiently. Its prevalence increases dramatically each year, and it is estimated that in 2025, 629 million people will suffer from this disease. Tea, a drink prepared from the leaves of *Camellia sinensis*, originates from ancient China and has become increasingly popular, being one of the most consumed beverages worldwide. Several studies indicate that tea and its components are responsible for several beneficial health effects, such as: antioxidant, anti-inflammatory, immunoregulatory, antidiabetic, anti-obesity and hepatoprotective.
Objective: The objective of this study is to determine the necessary dose of *Camellia sinensis* infusion for the treatment of T2DM.
Methods: A search was performed in the PubMed and ScienceDirect databases, using the keywords “green tea and diabetes”, “*Camellia sinensis* and diabetes” and “green tea dosage and type 2 diabetes”. Articles published between 2011 and 2022 were selected according to previously established criteria.
Results: Several studies indicate a volume of *Camellia sinensis* infusion necessary for there to be a therapeutic effect in the treatment of T2DM. However, these values are not consensual, and depend on several factors.
Conclusion: For the phytotherapeutic treatment of T2DM, 3 to 4 cups are required, corresponding to 840-1120 mg of catechins and 540-720 mg of EGCG (epigallocatechin-3-gallate).

Keywords: Type 2 diabetes mellitus; *Camellia sinensis*; Green tea; Dose.

KOMBUCHA: SYMBIOTIC CULTURES AND ITS IMPACT ON HUMAN HEALTH

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Kombucha is a sweet-sour fermented beverage that provides many benefits to human health, due to its high content on bioactive compounds and microorganisms metabolic activity. Its production involves tea, sugar, and a symbiotic culture of bacterias and yeasts (SCOBY), which is made of: 1) bacterias from acid acetic; 2) lactic acid; 3) yeasts.

Acid acetic bacterias promotes an antioxidant environment, cellular detoxification and confers anticancinorgenic properties. Lactic acid is involved in the synthesis of some important components and promotes a probiotic potential, and also has the ability to inhibit pathogenic bacteria that may be in the gut, through the production of bacteriocins and bioactive peptides. Moreover, lactic acid lowers the pH of Kombucha, promoting antimicrobial abilities, which improves blood circulation and prevents formation of blood clots. Yeasts are also responsible for producing essential substances, like vitamin B and amino acids. Certain microorganisms are only present in specific types of tea and may be determined by the type of sugar used in the fermentation, which influences the interaction between microorganisms and, consequently, the profile of the metabolites obtained. Overall, the health benefits of Kombucha, such as antimicrobial activity, body detoxification, increased bioavailability of phenolic compounds, antidiabetic potential and its minerals, vitamins and amino acids composition, are recognized and so, its regular consumption is recommended. However, more studies are needed to understand the possible influences of SCOBY on bioactive compounds and vice versa.

The aim of the following work is to understand the composition of SCOBY and its impact on human health.

Keywords: ‘’kombucha’’; ‘’bacterias’’; symbiotic culture’’; ‘’yeasts’’; ‘’microorganisms’’