Poster Week 19/2023

ABSTRACT BOOK

Escola Superior de Tecnologia da Saúde

Politécnico de Coimbra

May 8th – 12th 2023

estesc
Politécnico de Coimbra

SCIENTIFIC COMITEE

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Calendário

Poster Week 19/2023

	2ªf	3ªf	4ªf		5ªf	6ªf
	08/mai	09/mai	10/mai		11/mai	12/mai
8-9h						
9-10h	Fernandes Mendes - 8P Imunohemoterapia Clínico Lab. I CBL	João Joaquim Farmacoterapia - 10P Dietética e Nutrição	Inês Araújo Meios de Comunicação Não Oral II - 6P Audiologia			
10-11h						
11-12h	Jorge Balteiro Tecnologia e Farmácia Galénica II - 9P Farmácia	Ana Baltazar Tecnologia da Alimentação - 9P Dietética e Nutrição	Ana Baltazar Toxicologia da Alimentação - 8P Dietética e Nutrição		Cristina Santos Gestão da Qualidade da Água II - 7P Saúde Ambiental	Célia Gomes Microbiologia Alimentar - 7P Dietética e Nutrição
12-13h						
13-14h			Cristina Santos Certificação da Qualidade Alimentar - 3P Saúde Ambiental			
14-15h		Cristina Santos Saúde Pública - 7P Saúde Ambiental		Joaquim Pereira Electrocardiologia 2 - 15P FC	Diana Martins Anatomia Patológica Sistemática - 8P CBL	
15-16h			Paulo Matafome Fisiologia II - 8P Fisioterapia			
16-17h	Carla Matos Meios Técnicos de Reabilitação Auditiva - 6P Audiologia			João Lima Política Nutricional - 9P Dietética e Nutrição		
17-18h		Ana Lança Estágio II -1P SA				
18-19h	João Lima Nutrição Humana - 9P Dietética e Nutrição	Hélder Simões Coord. Seg. Construção Civil -1P SA				
19-20h						
20-21h						

INDEX

ABSTRACTS

THE RELEVANCE OF THE LANDSTEINER-WEINER BLOOD GROUP (ISBT 016) IN SCIENCE TRANSFUSION

Ângela Costa, Eva Sousa, Isa Pereira, Lara Alves, Sofia Santos

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The Landsteiner-Weiner (LW) blood group was discovered in 1940 alongside studies of the Rhesus system; initially it was thought that the LW system was the animal equivalent of the Rhesus system in humans. In 1963, however, it was confirmed that the LW system also occurred in humans and was considered an independent blood group; it was named Landsteiner-Weiner in tribute to these scientists. This system played an important role in our understanding of the hemolytic disease of the fetus and the newborn.

There are three antigens (Ag) in this system, a pair of antithetical Ag LWa(High frequency) and LWb (Low frequency), and the Ag LWab. These Ag are located on chromosome 19pl3 and expressed on a glycoprotein called ICAM-4 on the surface of redblood cells. The Ag of this system are linked to Ag D of the Rh system.

There are also antibodies (Ab), both alloantibodies and autoantibodies, the latter ones playing an important role in autoimmune hemolytic anemia.

When there is weak Ab anti-LW it can be misidentified as anti-D, it is very important to distinguish them, even though Ab anti-LW have low clinical significance in most cases.

This Ab can be identified in transfusion centers regardless of its complexity and ambiguity.

Keywords: Landsteiner, Antigen, Transfusion, Autoimmune hemolytic anemia, Hemolytic disease of the newborn

THE RELEVANCE OF DIEGO BLOOD GROUP IN SCIENCE TRANSFUSION

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The Diego Blood Group System was discovered in 1955, is the system 010 and comprehends 21 antigens (Ag), found on the Solute carrier family 4 (*SLC4A1*) gene, located on chromosome 17. To determine a person's Diego blood group is crucial to identify the presence or absence of Dia and Dib.

These Ag´s are carried on the erythroid band 3 protein (AE1), a protein integral to the red blood cell (RBC) membrane relevant in anion exchange through the RBC membrane and kidney tubule, and maintenance of cell integrity. Numerous mutations in the *SLC4A1* can lead to aberrant RBCs membranes and kidneys with impaired acid secretion.

Even though this blood group has 21 Ag´s, Wr^a & Wr^b and Di^a & Di^b are among the most important antithetical pairs. For the Diego Ag pair, there is the possibility of three phenotypes: Di(a+b+), Di(a+b-) and Di(a-b+).

Although Wra and Wrb are located on the band 3 protein, these Ag´s are in association with glycophorin A, requiring a complex to be normally expressed.

Anti-Dia and Anti-Dib are IgG antibodies, which are clinically relevant mostly to Hemolytic Disease of the Newborn, even though these antibodies are capable of inducing hemolytic transfusion reactions. Individuals who have the Di (a- b+) phenotype may become sensitized when the Dia Ag is present on RBC from transfusion or pregnancy by developing antibodies (Ab).

Di(a-b+), which is present in more than 99.9% of Blacks, Caucasians, and more than 90% of Asians, is the most prevalent phenotype.

Keywords: Diego, AE1, band 3, *SLC4A1*

THE RELEVANCE OF DOMBROCK BLOOD GROUP IN SCIENCE TRANSFUSION

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The Dombrock blood group system (014, DO, by International Society of Blood Transfusion) has two primary antithetical antigens (Ag), Do^a and Dob, and three Ag of high-prevalence, Gya (Gregory), Hy (Holley) and Joa (Joseph).

It's predicted that 99 percent of the individuals in the studied populations have the Gya , Hy and Joa Ag. The Do^a Ag is more common among Caucasians, while the Do^b Ag has a larger incidence in Africans and Asians.

The Ag are carried on a GPI-linked glycoprotein encoded by the DO gene, located on the short arm of chromosome 12. The lack of DO Ag can be caused by the loss of GPI-linked proteins from the surface of erythrocytes, resulting in a Dombrock-null phenotype.

Proteolytic enzymes such as trypsin, destroy or weaken the expression of Dombrock Ag on the erythrocyte membrane, while papain and ficin enhance the Ag recognition by the corresponding antibodies.

Although some neonates are Direct Antiglobulin Test positive, there are no reports of hemolytic disease of the fetus and newborn, but severe hemolytic transfusion reactions due to anti-Do^a or anti-Do^b antibodies have been reported.

Keywords: Dombrock, antigen, proteolytic, antibodies, HDFN.

THE RELEVANCE OF FORSSMAN BLOOD GROUP IN SCIENCE TRANSFUSION

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The Forssman blood group is a rare and complex system discovered by John Forssman, who first identified it in 1911 and it got its recognition as the 31st blood group in 2012 by the International Society of Blood Transfusion.

He used a suspension of horse or guinea pig kidney tissue to find this antigen (Ag). After injecting this suspension into a rabbit, realized that these antibodies (Ab) caused hemolysis of red blood cells (RBC).

Fs Ag are believed to be a subgroup of blood group A and were initially called *Apae*.

The *GBGT1* gene, which is responsible for the production of Forssman glycolipid synthase, has 347 amino acids and is located on chromosome 9. Few humans have been identified with FORS1 Ag on their RBC, a result of a missense mutation in the human Fs synthase gene where arginine at position 296 is replaced by glutamine.

The Forssman Ag is a low-frequency glycolipid, so most individuals are genetically Fs-negative. Some animals express this Ag on the surface of erythrocytes, however in humans, the Forssman Ag is not usually found on these cells, but it can be found in other body fluids and on various tissues, cells and organs.

Forssman Ab, produced by Fs-negative individuals, are naturally occurring and react strongly, leading to the agglutination and hemolysis of Forssman-positive cells. These Ab can be IgG, but they are predominantly IgM. They might constitute a barrier in transfusion/transplantation medicine and may be involved in perinatal hemolytic disease.

Keywords: Blood group, Forssman, Antigen, Antibodies

THE RELEVANCE OF CARTWRIGHT BLOOD GROUP IN SCIENCE TRANSFUSION

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The Cartwright blood group was discovered in 1958 through crossmatching, where was identified the antibody (Ab) Anti-Yta which detects the Yta antigen (Ag), present in red blood cells (RBC) of approximately 92% Caucasians. Ytb, the antithetic Ag, was identified in 1964 and is only present in 8% of Caucasians. Yta and Ytb differ only in the amino acid substitution at position 322.

The Yt Ag are found in RBC glycosylcholinesterase bound to glycosylphosphatidylinositol, giving rise to acetylcholinesterase (AchE). They are originated by mutations in the *ACHE* gene on chromosome 7q22. AchE has a regulatory function at neuromuscular junctions, but it's erythrocyte function is not well known. In addition, dithiothreitol (DTT) causes denaturation of these antigens. This blood group had only two Ag until 2017. In that year, YTEG was identified through plasma inhibition studies and molecular analysis. In 2018, YTLI and YTOT were added to the group, although little information is available about these Ab. It is important to note that only Yta and Ytb are recognized by the International Society of Blood Transfusion. As a result, the known phenotypes of the Cartwright blood group are Yt(a+b-), Yt(a+b+), and Yt(a-b+), and Yt(a-b-) has not been observed yet.

Ab Anti-Yta and anti-Ytb are IgG class, meaning that they can go through the placenta, however they’re clinically insignificant not causing hemolytic disease of the fetus and newborn (HDFN), for example. But previous studies showed incompatible blood transfusions can reduce RBC survival. Therefore, compatible blood transfusion is preferred.

Keywords: Cartwright system, acetylcholinesterase, transfusion.

THE RELEVANCE OF COLTON BLOOD GROUP IN SCIENCE TRANSFUSION

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The International Society of Blood Transfusion recognized Colton as the 15th blood group system in 1967. Colton system involves four antigens (Ag) well developed at birth, Coa, Cob, Co3 and Co4, located in chromosome 7p14, coded by the gene *CO* and detected in aquaporin-1 (AQP1), which can be found mainly on the red blood cells (RBC) surface. These Ag are able to resist the treatment of RBC with proteolytic enzymes, such as α-chymotrypsin, chloroquine, dithiothreitol (DTT), trypsin and papain.

The single difference between Coa and Cob is the replacement of an alanine (Coa) for a valine (Cob), which generates the polymorphism between them. Co(a+b-) phenotype is the most prevalent, followed by Co(a+b+) and Co(a-b+), with Co(a-b-) being the rarest among most populations. According to some reports, Colton-null individuals exposed to stress can have a deficit in urine osmolarity which can cause metabolic disorders.

Colton antibodies (Ab), produced after pregnancy or transfusion reactions, are normally IgG, so they react best with AGH at 37ºC, particularly if protease is used in the treatment of RBC. Besides that, Ab Anti-Coa, Anti-Cob and Anti-Co3 can activate complement. Ab such as anti-Coa and anti-Co3 have significant clinical relevance since there are significant reported cases of moderate and severe hemolytic transfusion reactions and Hemolytic Disease of the Fetus and Newborn (HDFN) related to them. However, no meaningful cases related to HDFN have been described attached to anti-Cob.

Keywords: Colton System, Science Transfusion, Aquaporin-1, Antigens, Antibodies, Hemolytic Transfusion Reactions, Hemolytic Disease of the Fetus and Newborn

THE RELEVANCE OF INDIAN BLOOD GROUP IN SCIENCE TRANSFUSION

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The Indian blood group consists of red blood cells with six antigens (Ag), which are, Ina, Inb, INFI, INJA, INRA, and INSL. These Ag are found on CD44, a glycoprotein on chromosome 11 at the p13 position, with functions as a leukocyte receptor, and as a cell adhesion molecule, it has 20 exons providing the existence of several isoforms.

In 1973, in India, the Ina antigen was discovered by Badakere, hence this group was called the Indian blood group, and in 1975 Inb was discovered. Later, in 1995 it was recognized by the International Society Of Blood Transfusion as the 23rd blood group system, with the knowledge of only two Ag, Ina and Inb.

As for its incidence, Ina is found in about 10% of Arab populations, that is, it is a low frequency Ag, unlike Inb which is a high frequency Ag in these same regions. In 2007, INJA (IN3) and INRA (IN4), two other high frequency Ag, were identified. In one of the CD44 isoforms there are also references to the presence of the AnWj Ag, but it is not part of the Indian system.

Antibodies (Ab) Anti-Ina and anti-Inb are two rare Ab that agglutinate respectively with Ina and Inb, except in the presence of enzymes. Anti-Ina can be of the IgG or IgM Ab, and there are no cases of hemolytic disease of the fetus and newborn, whereas anti-Inb is of the IgG class and contributes to severe transfusion hemolytic reactions.

Keywords: Indian blood group, Antigens, Blood Transfusion, Antibodies, CD44

THE RELEVANCE OF SCIANNA BLOOD GROUP IN SCIENCE TRANSFUSION

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The Scianna system is constituted by 7 antigens (Ag9), including a pair of antithetical Ag, the high frequency SC1 and SC2 Ag, a low frequency SC4 Ag and four very high frequency Ag. The Scianna Ag are located on the immunoglobulin superfamily glycoprotein, ERMAP, which contains disulfide bridges and an N-glycan. These Ag are encoded by a gene in which the chromosomal location is on the short arm of chromosome 1 between 1p36.2-p22.1.
The Sc:-1,-2 phenotype (null phenotype) has been most often found in individuals native to South Pacific islands. Antibodies (Ab) against Scianna Ag have been associated with mild to late transfusion reactions and mild haemolytic disease of the fetus and newborn. It is suggested that the Scianna blood group system eventually may be as complex as some of the other blood groups. Unique Ab have been found, suggesting an association with Scianna, but the full research required to qualify for blood group assignment is lacking. An example of possible extension is the report of three Sc:1,-2 individuals who produced alloantibodies that did not react with Sc:-1,-2 erythrocytes, and the Ab were mutually incompatible, indicating possible existence of three more high incidence Ag within this system.

Keywords: Scianna; Haemolytic disease; Radin Antibody; Antithetical antigens

THE ROLE OF ANTIOXIDANT AGENTS IN DIVERSE FIELDS

Gabriela Carvalho; Maria Coimbra; Sara Faria

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Antioxidants agents have a major role in preventing or reducing oxidative decomposition, which produces free radicals. Oxidation reactions lead to organoleptic changes, such as rancidity, which result from peroxide decomposition. Antioxidants inhibit these reactions by removing free radical intermediates, which, when oxidized, inhibit other oxidation reactions. Antioxidants can be hydrophilic, reacting with oxidants in the cytoplasm and blood plasma, or lipophilic, protecting cellular membranes from lipid peroxidation. They can also be classified as natural (found in food) or synthetic (such as butylated hydroxyanisole (BHA), butylated hydroxytoluene (BHT), and propyl gallate). BHA is a highly lipophilic antioxidant, while BHT is an organic compound used in the cosmetic and pharmaceutical industries to prevent the formation of free radicals and oxidation. Sodium metabisulfite is an inorganic compound used in the pharmaceutical industry as a preservative and is water-soluble. Phenolic compounds are primary antioxidants that enable the inactivation or removal of free radicals. Oxygen scavengers such as ascorbic acid captures the sorrounding oxigen, preventing oxidation. Chelating agents such as EDTA inhibit oxidation by complexing with metal ions, acting as auxiliary antioxidants. Some behaviors and precautions are needed to avoid oxidation in pharmaceutical formulations, such as storing products away from light, heat, and humidity, avoiding exposure to O2 and light, and controlling pH. Understanding the role of antioxidants in preventing oxidation and the different types of antioxidants and their sources is essential in many fields. By following proper storage procedures and using appropriate antioxidants, we can prevent or minimize the negative effects of oxidation.

Keywords: Antioxidants; Rancidity; Free Radicals; Oxidation

SUSPENDING AGENTS

Alexandra Marques; Andreia Carvalho; Andreia Barbosa; Bárbara Lima

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The suspensions are a complex and thermodynamically unstable system, and what is intended until the moment of their use is that there is homogeneity of dispersion of the particles, using the suspending agents. Suspension agents minimize the coalescence and the instability of the dispersed phase by interfering with the flow of dispersed particles or particle-particle attraction. The most frequent causes of instability are: the different densities; the particle size; and the viscosity of the dispersion phase. In this way, the suspending agents are added to dispersed systems in order to ensure that the solid particles in the formulation are evenly distributed in the continuous phase. The suspending agentes are grouped into four main categories: Humectant agents, to moisten the solution; Flocculating/deflocculating agents, to control the degree of flocculation; Viscosity modifying agents; Density modifying agents. As examples of suspending agents we have Sodium Carboxymethylcellulose (BONIASOL), Aluminum Magnesium Silicate (VEEGUM), and Sodium Starch Glycolate (VISCOSOL). It is known that the variation of the size, shape and density of the particles modify the stability of the suspensions, and for each case, an adaptation of the pharmacotechnical adjuvants should be made. We then conclude that the careful selection of suspending agents is essential to obtain a product that ensures that the dispersed phase does not settle quickly, that the system is easily redispersed into a uniform mixture when stirred, that it is easy to dispense from the container, and that it is easy to use by the consumer.

Keywords: Agents; Suspensions; Stability; Dispersion.

THE IMPORTANCE OF THE SOLUBILITY COEFFICIENT ON THE DEVELOPMENT OF A NEW DRUG

Claudio Oliveira; Francisco Mano; Lucas Rocha

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The knowledge of the solubility of a drug is extremely important to predict it's pharmacodynamics in a living organism, because this factor limits, in a large scale, the effectiveness of the compound when it reaches the biological phase. The solubility or solubility coefficient determines the quantity of solute that is possible to dissolve in a solvent, being this one dependent on the kind of solute that alters the solubility according to the solvent due to the intermolecular interactions, and also the temperature change, which according to the system's enthalpy can lead to precipitation or the dissolution of the solute.

During the development of a new drug, studies about drug polarity are indispensable to know if it has the capacity of being hydrophilic to dissolve in the plasma and lipophilic to pass through the plasmatic membranes and reach the target site.

To verify those characteristics solubility tests are made, which use different solvents like water or ethanol, allowing to obtain a partition coefficient that allows to understand which compound the molecule has more affinity, being afterwards possible to run predictions about the pharmacodynamics of the molecules in the human organism, predicting which organs and tissue the molecule is going to distribute more.

In short, the solubility coefficient depends on various factors and it's knowledge is fundamental to know the characteristics of the molecule and predict it's distribution in an organic system.

Keywords: Solubility coefficient; New drug; Pharmacodynamics

WETTABILITY OF PARTICLES IN SUSPENSION

Ana Capela; Catarina Morais; Elsa Oliveira; Sara Ribeiro

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A suspension consists of a heterogeneous system composed by two phases, an internal phase of insoluble solid particles and an external phase that can be liquid or semi-solid, where the particles are dispersed. A suspension can be used for various purposes, therefore it's necessary to present a good physical and chemical stability since it's considered a thermodynamically unstable system where the particles will tend to cluster leading to flocculation. In order to prevent this phenomenon, wetting and suspending agents are added, which make it possible to guarantee a homogeneous redispersion of particles by the surrounding liquid.

Wettability translates the tendency of a solid to engage in the vehicle, which can be watery or oily. A solid that presents greater wettability in oils is designated oleophilus/lipophile and if it presents a good wettability by water is a hydrophilic solid. When the opposite happens we are dealing with phenomena of hydrorepellency or oilrepance depending on the polarity of the vehicle, nonpolar or polar, respectively. According to the angle formed the particle and the vehicle we can have totally wettable particles (angle less than 45º), with intermediate wetability (angle between 45º and 90º) and non wettable (angle greater than 90º). When particles have low wettability they tend to form floculars or aggregates, decreasing the stability of the suspension.

This way, wetting agents are used to reduce the solid/liquid interfacial tension by reducing the contact angle between the solid surface and the liquid, thus increasing the wettability of the particles and consequently their stabilization.

Keywords: Suspension; Wettability; Particles

SILICONING OF INJECTABLE CONTAINERS

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The use of silicones to internally coat glass vials or ampoules was initially proposed in 1948. The coating formed by the silicones brings several advantages such as preventing aqueous solutions from contacting the glass, providing better stability to drugs, giving the glass greater shock resistance, and avoiding foam formation. In the past, during the siliconization process, silicones were applied in solutions using solvents such as ether, chloroform and carbon tetrachloride. The process consisted of filling the vials or ampoules with the previously mentioned solutions and, after rejecting the liquid, heating it with certain characteristics. This heating was intended, on the one hand, to eliminate the solvent, and on the other to cause the polymerization of the silicone, forming a film of molecular thickness. This thickness must be sufficient to ensure complete emptying of the vials or ampoules and to prevent a loss of activity of the preparation due to the influence of glass ions.

However, the process was abandoned because the solvents were expensive, leading to a process with a high cost and the possibility of interference reactions occurring with the solvents in the polimerization process. Thus, 2-5% aqueous silicone emulsions are currently used, which are cheaper and don't have these drawbacks.

In conclusion, for a correct silicone technique, it's necessary to clean the containers in which the silicone will be applied beforehand. If the siliconization is carried out correctly, obtaining a continuous and evenly distributed film, an increase in the chemical stability of the glass is achieved.

Keywords: Ampoule; Silicones; Injectables; Siliconization

FACTORS THAT INFLUENCE EXTRACTIVE DISSOLUTION

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Liquid pharmaceutical preparations can be obtained by simple dissolution or by extractive dissolution processes. The preparations obtained by extractive dissolution are thermodynamically stable physicochemical systems that aim to separate the active principles from the inactive substances. The choice of solvent should take into account the high affinity for the substance to be dissolved and low affinity for impurities, in addition to factors such as toxicity, cost, and volatility.

The main factors affecting the extractive dissolution process are temperature (influences the solubility of the substance and the viscosity of the solvent), agitation (increases the contact surface between the solvent and the substance to be dissolved), pH (affects substance solubility and solvent stability), concentration of the substance (affects the efficiency of the extractive dissolution), the contact time (the longer the substance is exposed to the solvent, the more complete dissolution) and the molar mass of the substance (influences the efficiency of extractive dissolution).

It is important to consider these factors when developing an extractive dissolution method to maximize the dissolution efficiency without harming the substance to be separeted or the stability of the solvent.

Keywords: Extractive dissolution; Solvent; Solubility; Impurities

OSTWALD CLASSIFICATION OF DISPERSED SYSTEMS

Bárbara Gomes; Bernardo Santos; Diogo Correia; Diogo Martins; João Gírio

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Friedrich Wilhelm Ostwald is widely recognized as the pioneer of physical chemistry. In addition to his significant contributions to the field of catalysis and the manufacturing process of nitric acid by ammonia oxidation, he also developed a technique for categorizing dispersed systems. Dispersed systems are a combination of two or more substances that have a discontinuous phase. They can be either homogeneous or heterogeneous, and the dispersed phase may or may not be distinguishable from the medium in which it is dispersed. Based on the particle diameter, these systems can be classified into suspensions (>0.1µm), colloidal systems (>0.001µm and <0.1µm), and emulsions (>0.001µm).

Suspensions are heterogeneous systems where the external or continuous phase is either liquid or semi-solid, and the internal or dispersed phase consists of solid particles that are insoluble in the medium used. Emulsions, on the other hand, are heterogeneous systems that are produced by mixing two immiscible liquids, where one of the liquids exists in the form of small globules within the other liquid. Ostwald's classification method categorizes dispersed systems based on the different internal and external phases, whether they are solid, liquid or gaseous. This classification system is particularly beneficial because it interconnects the possible combinations of the external and internal phases in the three physical states, which is useful in the classification of pharmaceutical forms.

Keywords: Ostwald´s classification; Dispersed systems; Suspensions

IMPORTANCE OF THE DISPLACEMENT FACTOR IN THE PREPARATION OF SUPPOSITORIES

Ana Portela; Cristina Martins; Francisca Rodrigues; Inês Rodrigues; Simone Martins

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Suppositories are unitary solid pharmaceutical preparations of firm consistency, conical or oval form, destined for rectal, vaginal and urethral application. These are obtained by solidification, compression or moulding, alveoli filling is volumetric, and the liquid mass is prepared by fusion. The displacement factor is the “Mass in grams of the excipient displaced by 1 g of the active ingredient“ according to (Le Hir, 1995), this is important for calculating the amount of excipient required, assuming the amount of active ingredient is known. If the densities were equal, the masses would occupy the same volume (volumetric filling), but this does not happen. Since densities are usually different, we use the displacement factor to take into account the mass of the excipient corresponding to the volume occupied by the active substance. There are tables that show the density ratio between the excipient and each active substance.

Excipient weight = Suppository Weight - (Active substance weight / Density)

Excipient weight = Suppository Weight - (Active substance weight x Displacement factor)

It is after all a physical quantity that is given by the relationship between the density of the excipient and the density of the drug, so the displacement factor of a given drug is the reverse of its apparent density concerning the same excipient: Displacement factor = 1 / Density active substance

It is important to acquire knowledge about the displacement factor to establish the formula by weight of suppositories, whose distribution is performed as a function of the volume of mould alveoli.

Keywords: Displacement factor; Suppositories; Excipient; Density

SOLUTION CORRECTIVE AGENTS

Andreia Ferreira; Inês Sousa; Joana Martins; Lara Ramos

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Solutions are homogeneous systems formed by two distinct components: the solute and the solvent. While the solvent is always in liquid form, the solute can be presented as liquid or solid. When there are several liquid components, the one that presents itself in greater quantity is always considered the solvent. For the formulation of these pharmaceutical forms it is essential to use corrective agents Corrective agents aim, among other functions, to regularize undesirable organoleptic characteristics in solutions, since they have the potential to rectify adversities in adherence to and administration of therapy. Thus, they can be divided into two major groups: increasing adherence to therapy and increasing the stability of the solution. Flavorings, dyes and sweeteners provide greater ease of adherence to therapy, mainly on the part of pediatric patients, taking into account that they improve the odor, appearance and taste of the solutions. On the other hand, in order to increase the stability of the solutions, corrective pH agents, anti-oxidants, preservatives, anti-hydrolytics, solubilizing and surfactants are added. These agents act directly on the compatibility of the solution with the physiological environment, in promoting the dissolution of drugs, preventing the development of pathogens and slowing/preventing reactions between their constituents.

We conclude, therefore, that the corrective agents of solutions are a great asset in the development and balance of these pharmaceutical preparations, assisting and ensuring therapy, especially in geriatrics and pediatrics.

Keywords: Solutions; Corrective agents; Stability; Organoleptic characteristics

THE ADVANTAGE OF USING OSTEOINTEGRATED IMPLANTS IN INDIVIDUALS WITH UNILATERAL HEARING LOSS

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Introduction: Osteointegrated hearing devices are hearing aids that use an external receiver to stimulate bone conduction of sound through a titanium prosthesis placed on the skull bone, delivering sound directly to the cochlea without passing through the external and middle ear. Objective: The aim of this study is to investigate the importance and advantages of placing osteointegrated implants in individuals with unilateral hearing loss. Methodology: To achieve the objectives of this study, nine online articles were analyzed, two from "Wiley Online Library", one from "Otolaryngologic Clinics of North America", two from "International Journal of Pediatric Otorhinolaryngology", three from "Otology & Neurology", and one from "Taylor & Francis Online". Keywords such as conductive hearing loss, hearing bone implant, osteointegrated implant, unilateral hearing loss were used to find these articles. Results: After research and data collection, it was found that these osteointegrated implants are highly effective in cases of conductive hearing loss, where sound waves cannot pass through the external and middle ear, preventing them from reaching the cochlea. These devices are also very useful in situations of unilateral hearing loss, as individuals with this problem often feel that only one ear is unable to meet their needs in situations of dialogue in noisy environments or when trying to locate the origin of sounds in their daily lives. Conclusion: These devices are a fantastic discovery as they solve conductive hearing losses, improving the quality of life of individuals with unilateral hearing loss.

Keywords: Conductive hearing loss, Hearing bone implant, Osteointegrated implant, Unilateral hearing loss

REHABILITATION METHODS IN OTOSCLEROSIS

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Introduction: Otosclerosis is a pathology almost exclusive and specific to the middle ear, which affects the temporal bone, more specifically the optical capsule. Initially it occurs bone reabsorption, followed by the replacement of lamellar bone by sclerotic bone. In the beginning it occurs conductive unilateral hearing loss, but with the progression of the otosclerosis it may even affect the bone labyrinth of the inner ear (cochlea), turning into a mixed bilateral or sensorineural hearing loss. Objective: Describe and identify methods of auditory rehabilitation, other than surgery, in patients with otosclerosis. Methodology: Review and consultation of articles related to the topic. In the exclusion criteria we took into account its date of publication (we use those that were published after 2000) and articles that only talk about surgery as a solution for this pathology. As for the inclusion criteria, we used articles that talk about alternative treatments other than surgery. Results: There are several treatments, each used according to the diagnosis. The surgery (stapedotomy and stapedectomy) it's the first treatment to be recommended to a conductive hearing loss because of its effectiveness. However, if surgery is contraindicated, hearing aids or implants for mixed or sensorineural losses may be an option. There are also several types of implants, such as middle ear implants, bone conduction implants, and cochlear implants. Conclusion: An early and assertive diagnosis is essential for a correct forwarding of the patient. We can observe that there are different types of treatment that can be used in this pathology, such as surgery, hearing aids and hearing implants.

Keywords: Otosclerosis, Rehabilitation Methods, Surgery, Hearing Aids, Pathology

AUDITORY REHABILITATION OF THE CHRONIC OTITIS MEDIA IN ADULTS

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Introduction: Chronic otitis media (COM) in adults is a condition in which a middle ear infection becomes chronic, meaning it persists for more than three months despite adequate treatment. Symptoms can include otalgia, hypoacusis, fever, tinnitus, otorrhoea and sensation of ear fullness. The treatment varies depending on the type and severity of COM, but although there is medical-surgical treatment there is often no success in the hearing recovery, so auditory rehabilitation can be a solution. Objective: Based on a literature review we intended to understand how the auditory rehabilitation in adults with COM is carried out. Methodology: A search was carried out in the Academic Search Complete; B-on; PubMed databases, using the search engines: “Chronic Otitis Media” and “Auditory Rehabilitation” in Portuguese and English, using as inclusion criteria: age over 18 years, clinical diagnosis of COM and in a process of auditory rehabilitation. A total of thirteen articles was obtained, being excluded three for being studies made in minors, remaining with ten articles. Results: In COM the most recommended devices are retroauricular, not being possible the adaptation of the devices with electroacoustic components inside the external auditory canal. The most used mold is in acrylic with mandatory venting. The Bone Anchored Hearing Aid (BAHA) was the method used in four proposed studies. Conclusion: Although surgery is the first option in the treatment of COM, in cases where this is not possible, auditory rehabilitation is a successful possibility.

COMPLICATIONS OF EARMOLD IMPRESSIONS

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Introduction: Ear molds are individually made parts that are inserted into the outer canal to conduct the sound amplified by the hearing aid to the tympanic membrane. To be manufactured, an impression of the earmold is required to capture the anatomy of the outer ear. There are several methods of molding, and it will be noted that the process isn't always safe, and can bring complications for the patient. Objective: Based on a review of the literature, we aim to analyze the possible complications in impression taking. Methodology: A search was made based on Google Scholar and PubMed. The keywords were: earmolds; impression; complications and middle ear, where, from 8 articles, 4 were selected. From the selected articles, those published before 2015 were excluded. Results: The possibility of serious injury was observed in a minority of cases. Although rare, the most common complication was the entry of mold material into the external ear canal. This occurred in patients with a pre-existing tympanic membrane perforation, although traumatic perforation also occurred. Conclusion: It was concluded that complications of the procedure are rare, but they do happen, the main cause being that the impression material enters the middle ear. Because this problem can occur in patients with no history of surgery or otologic problems, fitting hearing aids requires a prior audiological examination. Also, because of the risk of secondary injuries during impression taking, this procedure should be carried out under the guidance of an audiologist.

Keywords: Earmolds, Impression, Complications, Middle ear

MIDDLE EAR IMPLANT: ADVANTAGES AND DISADVANTAGES

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Introduction: A Middle Ear Implant (MHI) is a device that picks up sounds through na audio processor that is introduced into the ossicular chain for the purpose of converting sounds into mechanical stimuli from the ossicles in the middle ear. These devices are available in partially or fully implantable, piezoelectric or electromagnetic systems.
The IOM, converts sounds into vibrations, that is, it makes the ossicles vibrate in the same way as normal sounds and the ear canal remains completely free. Objective: The aim of this research is to understand the functioning of a Middle Ear Implant and determine the advantages and disadvantages. Methods: This work was carried out based on review and literature of scientific articles and theses. Keywords used: middle ear implant, advantages of IOM, disadvantages of IOM, deafness and sensorineural hearing loss. In total, 3 articles were used and any article published before 2010 was discriminated. Results: The results obtained after the placement of middle ear implant vary from individual to individual, duration and the degree of hypoacusis, varies with age. Its advantages are the absence of feedback for example, but it also presents some risks such as the appearance of sensorineural hypoacusis or the discontinuity of the ossicular chain. Conclusion: In general, IOMs bring advantages to the patients who use them, namely, advantages such as sound quality, absence of occlusion/ distortion, as well as with the aesthetic appearance. However, there is still some controversy regarding the indications, derived, to the technological evolution of hearing aids, these achieve the same objectives, without surgery and with lower costs.

Keywords: Middle ear implant (MEI); Deafness; Sensorineural hearing loss

THE EFFECTIVENESS OF AUDITORY TRAINING IN THE REHABILITATION OF INDIVIDUALS WITH COCHLEAR IMPLANTATION

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Introduction: Difficulty in understanding speech is one of the main consequences of hearing loss, thus affecting participation in social, leisure and work activities, especially in severe hearing loss. To avoid these consequences, we resort to the Cochlear Implant, an electronic device surgically placed in the individual's inner ear that aims to provide hearing abilities. To complement the implant's functionality, auditory training is often used. This consists of specific exercises to stimulate auditory skills, using the neuroplasticity of the brain to improve auditory processing and the ability to understand sounds, especially in a noisy environment. Objective: We intend to evaluate the effectiveness of auditory training in the rehabilitation of individuals with cochlear implantation. Methodology: The study was based on ten scientific articles, from Web of science and Google Academic, including age range from children to elderly, excluding people without cochlear implants. Results: Auditory training varies according to the type of implants and the hearing loss of each patient. Individuals with hearing loss seem to benefit most from a combination of rehabilitation and training. Conclusion: This fusion of cochlear implantation with auditory training is now a common and safe treatment to restore speech and sound perception in people with hearing loss. Listening with a sound processor is more than just turning it on. Learning to listen takes time, practice, and patience to make the most of the device's potential, since each person has his or her own rhythm. The only failure is to stop trying.

Keywords: Cochlear Implant; Auditory Training; Hearing Loss

WHAT IS VITAMIN D DEFICIENCY AND HOW TO PREVENT IT?

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Introduction: Vitamin D is a fat-soluble vitamin that can be synthesized on the skin via sunlight, 50-90% of vitamin D is absorbed through this mechanism. An alternative main source of vitamin D is the dietary intake of fatty fish livers and fortified food. This micronutrient plays an important role in calcium homeostasis and bone metabolism. Vitamin D deficiency is a concern around the world, affecting both developed and developing countries with a prevalence of about 1 billion.
Objective: Present the impacts of Vitamin D deficiency.
Methods: Publications from google schoolar were analysed and searched on the website with the keywords "vitamin D deficiency". From the 21.900 articles obtained since 2019, we went through seven articles whose titles appeared to be more suitable for our project's objective, and chose three.
Results: Vitamin D deficiency can lead to osteomalacia and rickets in children and osteomalacia in adults. Many studies show an association between vitamin D deficiency and cancer, cardiovascular disease, diabetes, autoimmune diseases, and depression. The patients most affected by this condition are elderly, obese people, nursing home residents and hospitalized patients, most of whom are asymptomatic. In theory, a higher intake of foods rich in vitamin D would be a solution but this is not sustainable, therefore supplementation with vitamin D2 or D3 is the most frequent strategy.
Conclusion: It is important to emphasize that high-risk individuals should be followed to prevent this malnutrition, as there are only a small number of options to combat vitamin D deficit.

Keywords: Vitamin D; Vitamin D deficiency; Vitamin D deficiency Prevention

VITAMIN B9: WORLDWIDE DEFICIENCY AND IT CONSEQUENCES

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Introduction: Vitamin B9 or folic acid is a vitamin of Complex B, an essential water soluble vitamin that needs to be supplied by food . It has several functions in metabolism, such as nucleic acid synthesis, blood cell formation and optimal functioning of the nervous system and bone marrow.
Objective: Identify deficiency of vitamin B9 around the world and its consequences.
Methodology: A search on Pubmed was made with the words “acid folic deficiency” which gave 9,568 results. Later the filters “Free full text” and “Review” in the last 3 years were applied, restricting the number to 82 results. Having read the titles and excluded the ones that weren’t related to the topic, of the remaining titles were read the abstracts and selected 3 articles.
Results: It’s estimated that folate deficiency is the most prevalent vitamin deficiency in the world. A total of 11 surveys reported a prevalence of folate deficiency greater than 40% in most countries.Folate deficiency and associated metabolic disorders are probably most common for the elderly, who don’t receive adequate nutrition, and women of reproductive age who follow strict diets. Epidemiological studies show an association between low levels of folates in women and the appearance of congenital malformations in fetuses, such as spina bifida.
The World Health Organization recommends daily oral supplementation of folic acid along with iron during pregnancy.
Conclusion: There is a global vitamin deficiency that can provoke some diseases as the ones that were mentioned before. This deficiency can be suppressed by using supplementation and alerting the general population of its importance.

Keywords: Keywords: Acid folic; Vitamin B9; Global deficiency and consequences.

IODINE: IMPORTANCE AND DEFICIENCY OF THIS MICRONUTRIENT

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Iodine is a trace element that is essential for life and normal body function. It has a crucial role in the biosynthesis of thyroid hormones that are vital for the development, growth, and metabolic processes of human organs. The aim of the poster is to emphasize the importance of iodine, specifically in understanding the impacts of its deficiencies (e.g., spontaneous abortion, mental confusion, deterioration of skin and hair health) and how to obtain the necessary amounts of this trace element. The research was based on official platforms such as the General Direction of Portuguese Health, the World Health Organization, and the National Institute of Health and Iodine Global Network and found that about 30% of the world's population lacks this micronutrient. Certain populations (e.g., Madagascar) and groups (e.g., women, children under three years old) are at the higher risk of iodine deficiency. Since iodine is not produced by the body, its intake should be obtained through food (e.g., iodized salt, fish, seafood). The Universal Salt Iodization Program has ensured a higher availability of iodine worldwide. In Portugal, pregnant women are the most affected group by iodine deficiency, with over 80% not reaching the required iodine amount. To prevent iodine deficiency in Portugal the DGS, in 2013, implemented recommendations regarding iodine supplementation during preconception, pregnancy, and breastfeeding, as well as the use of iodized salt in school canteens. Iodine plays a crucial role in people's health and well-being, and it is necessary to raise awareness of its importance and promote adequate iodine intake.

Keywords: Iodine, Deficiency, Sources, Intake

THE IMPACT OF IRON ON HEALTH - ITS CAUSES AND ITS CONSEQUENCES

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Introduction: Iron is a mineral of great importance in our body. Iron deficiency is a form of anemia due to the lack of sufficient iron to create healthy red blood cells. It is caused by inadequate intake of iron, chronic blood loss, or a combination of both, and is the most common nutritional disorder in the world and in different age groups. This disease and this cause has been quite prevalent in the world for years.
Objective: Why is there iron deficiency in diets in different parts of the world and its impact on different age groups.
Methodology: The scientific research for this paper was based on the websites ResearchGate and PubMed, which provided us with resources regarding about iron deficiency and its consequences. Twenty-three articles were obtained from 2015 to 2020, of which nine were selected for reading and two were used.
Results: Iron is an essential nutrient for health. There are foods with iron more easily absorbed by the body and therefore more suitable for those with anemia and also those with slower absorption. Considerations presented by the World Health Organization indicate that approximately two billion people are anemic, showing the seriousness of the public health problem.
Conclusion: In cases of anemia and other symptoms that indicate iron deficiency, supplementation should be indicated by a professional. Blood tests indicate low or high levels of the nutrient, but among the signs of mineral shortages are tiredness, physical indisposition, changes in body temperature regulation.

Keywords: anemia; iron deficiency and excess; prevalence; treatment; 21 century

THE EFFECTS OF VITAMIN B12 DEFICIENCY IN VEGETARIAN PREGNANT

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Introduction: Vegetarian diets are increasing worldwide, being a usual alternative during pregnancy and lactation. Vitamin B12 deficiency is a common complication in these cases, since is only provided by animal origin foods, and can affect maternal and fetal health, since its essential in cellular metabolism.

Objectives: Understand the consequences of vitamin B12 deficiency in vegetarian pregnant and possible prevention.

Methods: This work was conducted through a short survey of populations most affected by vitamin B12 deficiency, from which we chose vegetarian diets. Through Google Scholar, we searched for review articles since 2022, using the term "carência de vitamina B12 em vegetarianos" in portuguese, where we obtained 17 results. Of these 17, we excluded those that did not refer to the vegetarian population. In the end, we selected 4.

Results: Vitamin B12 acts in the maturation of red blood cells and in the proper functioning of the nervous system. Its deficiency can then cause irreversible damage, such as pernicious anemia, neuronal and red blood cell maturation failures. Some manifestations in the baby can be hypotonia, weakness, apathy and regression in its development.

Conclusion: Supplementation and professional monitoring are essential for vegetarian pregnant women, in order to reduce nutritional risks during pregnancy. Furthermore, this supplementation ensures that there is no shortage of this micronutrient, which is essential during pregnancy due to its influence on serum, breast milk and infant plasma concentrations.

Keywords: "B12 vitamin"; “deficiency in vegetarians and pregnant women”

VITAMIN A

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Introduction: Vitamin A is an essential fat-soluble vitamin that plays a crucial role in various bodily functions, including immune system health, vision, cell growth and development, reproduction, and maintenance of healthy skin.
Objectives: The main objective is to present the vitamin A, and to find out his functions, benefits and harms.
Methods: The research for the work was carried out through the database of the Harvard T.H. Chan School of Public Health - Harvard University, MSD MANUAL professional version, by using the term "Vitamin A".
Results: The two main forms of vitamin A in the human diet are preformed vitamin A, and provitamin A carotenoids such as alpha-carotene and beta-carotene. Preformed vitamin A comes from animal products, fortified foods, and vitamin supplements.
Carotenoids are found naturally in plant foods. According to studies, eating a variety of foods rich in vitamin A, especially fruits and vegetables, is protective from certain diseases, though the health benefit of vitamin A supplements is less clear.
Conclusion: Vitamin A is an essential nutrient that is necessary for maintaining human health. A well-balanced diet that includes sources of both retinoids and carotenoids can help ensure adequate vitamin A intake. However, excessive intake
of vitamin A should be avoided to prevent toxicity.

Keywords: Benefits; Harms; Vitamin A

HOW IMPORTANT CHROMIUM IS IN HUMAN NUTRITION

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Introduction: Chromium is an essential mineral that plays an important role in human health. It is required in trace amounts for optimal health, and it is involved in various physiological processes, including glucose metabolism, insulin regulation, and energy production.
Objective: Understand how important chromium is in human nutrition and problems associated with its absence.
Methods: literature review was conducted using PubMed database, throught keywords "chromium" and "human nutrition", in a time span of 5 years. 1086 articles were found, we selected some articles to read the abstract, whose title was related to human health/human nutrition. After this, we chose one article that best fit our topic.
Results: The recommended dietary intake of chromium varies depending on age and gender. However, the amount of chromium in foods, such as fish, coffee can vary widely, and some processing methods can reduce the chromium content, example: removal of peel, leading to a risk of lack. Chromium deficiency is rare but can occur, as the required amounts are very small. However, malnutrition, pregnancy, and stress are situations where this deficiency can occur, resulting in glucose intolerance, weight loss, and nerve damage. Several studies described the potential health benefits of chromium supplementation, particularly for individuals with type 2 diabetes. A review article by Anderson et al. (2014) suggests that supplementation with chromium picolinate may improve glucose control and reduce insulin resistance in people with type 2 diabetes.
Conclusion: Chromium is an essential mineral in body and its absence can lead to weight loss, glucose intolerance and nerve damage.

Keywords: Chromium, human nutrition, human health, diets

Discipline: Human Nutrition

Professor: João Lima, Raquel Oliveira

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THE MINERAL SELENIUM

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Objectives: Understand what selenium is, its importance and where there is a lack of this mineral, if any. Analyse the consequences of selenium deficiency.
Methods: Research and analysis of publications on the web about selenium. Such as “Selénio”- PNPAS (DGS) and “Carência do micronutriente selénio" - Selenio.pt. The articles and online publications are between the years 2015 and 2022. The research was more based on the abstract of the article “Selénio e a importância para o organismo humano - benefícios econtrovérsias ”.
Results: Agricultural soils in many European countries are relatively low in selenium, which is reflected in agricultural crops and in the animals that feed on them.
In 1970, Finland was the country where selenium deficiency was the most worrying.
According to studies, the European population consumes half the recommended intake of selenium (100 µg). Vegetarians and those on gluten-free diets are more prone to selenium deficiency due to their diet.
Selenium deficiency can cause muscle weakness, adversely affect the immune system and can lead to the onset of Keshan disease.
Conclusion: Due to selenium deficiency, in Finland in 1984 a law was passed to make it compulsory to enrich all fertilisers with selenium to increase selenium levels in crops, and it worked. Thus, with selenium-enriched soils, the products grow there will have higher selenium content, with all its attendant benefits.

Keywords: selenium, foods, deficit

IMPORTANCE OF CALCIUM TO THE HUMAN BODY

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Introduction: Calcium is an essential mineral for the human body, playing a vital role in a wide range of physiological functions. All living cells require calcium to remain functional and it's required for the proper functioning of the nervous system, muscles, and bones. Adequate intake of calcium is crucial for overall health and well-being. Its deficiency can lead to serious health consequences.

Methods: The information presented is based on a review of literature and research studies from the last 10 years gathered through Google Scholar using "Calcium" and "Calcium human body" as keywords, showing around 1690000 and 1370000 results, respectively. The articles were chosen after analyzing their abstracts and its relevance for this work

Results: Calcium plays a vital role in bone health, and it is particularly important for children, adolescents, and postmenopausal women. In addition, calcium engages in the regulation of blood pressure, muscle function, and the secretion of hormones and enzymes. The primary dietary sources of calcium include dairy products, fortified foods, and supplements. Those who live in low and middle-income countries are at the greatest risk of suffering from calcium deficiency.

Food-based interventions and vitamin D and calcium supplementation prevent future problems associated with low calcium intake.

Conclusion: Adequate calcium intake is essential for overall health and well-being. Individuals should strive to consume calcium-rich foods or supplements to meet their daily requirements. Health professionals should be aware of the potential consequences of calcium deficiency and supply proper advice to patients to ensure they are getting enough calcium to keep proper health.

Keywords: Calcium, physiological functions, intake, dietary sources, calcium deficiency

THE OVERUSE OF LAXATIVES

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Introduction: Laxatives are a class of drugs that include a variety of drugs with different mechanisms of action for the elimination of feces. These range from bulking agents to stool softeners and drugs that stimulate the intestinal wall, increase intestinal fluids or reduce the absorption of food to speed up bowel emptying (1). Although its use is recommended in cases of constipation, the prevalence of laxative abuse is quite common, especially in the elderly and people with eating disorders. This may be related to factors such as the belief that laxatives help eliminate calories from food or misinformation about what constitutes a healthy bowel habit (2) (3).

Objective: Understand the nutritional impact caused by the abuse of laxatives.

Methodology: In March and April 2023, a literature review was conducted, following the PRISMA method, mainly using the PubMed and Scopus databases. Thirty articles were found from the last thirteen years. After reading them, sixteen articles were selected for full analysis.

Results: Through the interpretation of the various articles, we verified that the abusive use of laxatives compromises normal intestinal function, bringing a series of associated problems, such as dehydration, the loss of vitamins and nutrients and the loss of potassium and bicarbonate through the feces, resulting in hypokalemia and metabolic acidosis (3).

Conclusion: It was possible to conclude that the abuse of laxatives has a great nutritional impact, especially in relation to mineral losses. Thus, since nutrition is one of the first lines of prevention of gastrointestinal diseases, it is recommended to adopt a balanced diet with adequate amounts of fiber, which helps in intestinal motility.

Keywords: “laxatives", "nutrition", "abuse", "bowel function"

PHARMACOTHERAPY IN OBESITY

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Introduction: The World Health Organization (WHO) defines obesity as a pathology in which excess accumulated body fat, due to a chronic balance of positive energy, can reach degrees that negatively affect health. This leads to the development of pathologies such as hypertension, diabetes, dyslipidemia, and insulin resistance, which has encouraged the development of new drugs.
Objectives: To understand the impact of pharmacological treatments on obesity.
Methods: The scientific research for this article was based on academic Google, Pubmed and B-on. Fifty-three articles were obtained, of which ten were selected for reading and five for concrete use.
Results: Recently approved drugs for the treatment of obesity are orlistat (Xenical and Alli), phentermine/topiramate (Qsymia) and lorcaserin (Belviq²). Orlistat is the only drug approved in Europe; the other two, being of superior efficacy, await approval.
Discussion: The treatment of patients with obesity aims to reduce their fat mass, which is necessary to avoid diseases caused by metabolic changes. In addition to lifestyle changes, using drugs for treating obese patients is extremely important. However, in the USA, there have been concerns about the "off-label" use of some medicines by consumers who wish to lose weight for aesthetic reasons, so their use should be limited to the patients they are indicated.
Conclusions: Thus, the pharmacological treatment, which until now has offered little to treat obesity, is currently very promising, with new drugs recently on sale in the USA and with the prospect of marketing in Europe soon.

Keywords: Obesity; pharmacotherapy; drugs; anti-obesity.

THE USE OF ANTIBIOTICS AND NUTRITION: WHICH FOODS CAN HINDER THE ABSORPTION OF ANTIBIOTICS IN THE BODY

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Introduction: Antibiotics and nutrients may interact with each other, which is a relevant problem in clinical practice due to the possible risk/benefit ratio.
Objective: This study aims to characterize the drug-food interaction as well as its influence on therapy.
Methods: The work was carried out through the PubMed and Google academic databases, using the keywords “Interaction”, “Antibiotics”, “Nutrient”, “Drug”, and “Food”, 35 articles were obtained from the last 20 years. Excluding repeated articles, 20 articles were selected to extract their results.
Results: Several antibiotics interact with food in general. Tetracycline forms stable chelates with Ca++, Mg++ and Fe+++ polyvalent metal cations. Amoxicillin and benzylpenicillin inhibit the synthesis of vitamins K and B12 by reducing the intestinal microbiota. Neomycin and Isoniazid increase the needs of Na, K, Ca, Fe, and Vitamins B12 e B6. Caffeine and alcohol decrease the antibiotic’s effect.
Discussion: Drug-nutrient interaction can alter the rate of antibiotics or nutrients’ absorption. Foods rich in calcium, magnesium and iron may affect the bioavailability of some antibiotics. The consumption of these, when combined with antibiotics, should be avoided. When the synthesis of vitamins B12 and K is inhibited, the intake of probiotics, prebiotics and fiber is recommended.
Conclusion: Due to these interactions, knowledge about the main associations of antibiotics with the prescribed diet is essential, to avoid therapeutic failure and malnutrition in patients.

Keywords: “Interaction”; “Antibiotics”; “Nutrient”; “Drug"; “Food”.

USAGE OF ISOTRETINOIN BY WOMEN IN REPRODUCTIVE AGE

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Isotretinoin is a medication used primarily to treat severe acne. It is a form of vitamin A and works by reducing the amount of oil produced by the skin's oil glands, which in turn helps to prevent acne. Isotretinoin is a powerful medication usually prescribed for severe acne that has not responded to other treatments. It is available in various forms, including capsules, creams, and gels, and is typically taken for several months.

The main objective is to highlight, and understand how isotretinoin produces results and what the benefits and disadvantages of isotretinoin focusing on its usage by women of reproductive age.

Literature review was conducted, where we searched throughout for the words - isotretinoin, women, acne, healthcare. When we finally came upon several articles, we selected four of them from the last five years.

According to the results of the articles, it was observed that women of reproductive age are more susceptible to developing embryopathies or abortion. The main adverse effects were associated with cardiovascular (18.2%), hepatic (27.3%), and lipid profile changes (36.4%), indicating a potential need for monitoring these patients. Studies that observe the effects that isotretinoin can cause in pregnant women have not yet been conducted, considering that isotretinoin is contraindicated during pregnancy.

Isotretinoin has been shown to be an important tool in the treatment of acne. However, there are significant side effects, and therefore it should always be advised alongside the guidance of a healthcare professional to monitor the treatment.

Keywords: isotretinoin, women, reproductive age, acne

EFFICACY AND SAFETY OF SEMAGLUTIDE FOR WEIGHT LOSS

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Introduction: Obesity is a chronic, relapsing disease associated with multiple complications and a substantial morbidity, mortality and healthcare burden. There is great interest in developing non-invasive pharmacotherapeutics to help combat obesity. Glucagon-like peptide-1 (GLP-1) receptor agonists, like semaglutide, are a class of antidiabetic medications that have shown promise in encouraging glycemic control and promoting weight loss in patients with or without type 2 diabetes.

Objectives: This systematic review aims to summarize and analyze the efficacy and safety of semaglutide on weight loss.

Methods: A literature review was conducted between the eighth and fifteenth of april through SpringerLink and PubMed databases, using the expressions “Semaglutide” AND “Weight loss”. After reading the titles and the abstracts, 19 articles were selected for full reading and analysis.

Results: It appears that weekly 2.4 mg doses of subcutaneous semaglutide are associated with weight loss in people with overweight or obesity. Most people can tolerate semaglutide well. The most common side effects (nausea, vomiting, and diarrhea) are usually mild and occur in the first few weeks of treatment, reducing over time.

Conclusion: In clinical trials, semaglutide was well tolerated and effective at helping people prevent weight regain and maybe a good option for long-term weight control and lowering patient’s chances of serious health problems. However, ongoing treatment is required to maintain improvements in weight and health because participants regain two-thirds of their prior weight loss after treatment withdrawal confirming the chronicity of obesity.

Keywords: Semaglutide, weight loss, diabetes, obesity

USE OF VENVANSE, AN ADHD DRUG, IN BINGE EATING AND WEIGHT LOSS

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Introduction: Lisdexamfetamine Dimesilate (LDX) is indicated for the treatment of attention-deficit/hyperactivity disorder (ADHD)(2) and binge eating disorder (BED), in various age groups and with different consequences (9, 10).
Objective: Understand the use of Venvanse in ADHD, binge eating and weight loss.
Methods: The literature review was performed using PubMed. Eighteen articles (clinical trials) from the last five years were found. After reading the titles, fifteen articles were selected, of which, after reading the abstracts, only eleven were selected for full reading/analysis.
Results: Age and sex do not influence the treatment of binge eating (2). Increase satiety and improve cognitive control(6). Abrupt discontinuation was not associated with withdrawal symptoms (7). There was stability in the treatment of adults with ADHD(1). Improvement after lisdexamfetamine versus placebo in assessments of TSS, ADHD, executive function deficits and functional impairment(3). In children, lower BMI-z, weight z and height z in children(8) and the risk of eating disorders(10). The neural mechanisms by which psychostimulants attenuate ADHD symptoms remain unknown.(4) Viloxazine with the psychostimulant lisdexamfetamine does not impact metabolism(5). There is a negative relationship with the monoamine oxidase inhibitor antidepressant(11). Conclusion: This medication is effective in treating ADHD and binge eating. It reduces daily intake and consequently weight, which in children is not advantageous and may even lead to eating disorders. The case of inappropriate use for weight loss without compulsion and/or ADHD is not studied, but the increasing use generates this need for the study. Important to understand which medications are taken together.

Keywords: Vyvanse, lisdexamfetamine, weight loss medication, binge eating disorder, monoamine oxidase inhibitor, ADHD.

EFFECTS OF NSAIDS ON GASTRIC ULCERS

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Introdução : NSAIDs are a group of drugs that are prescribed all over the world and are routinely used in clinical therapy, mainly for the treatment of inflammation anda cute, moderate or chronic pain resulting from inflammation. However, the most observed side effect resulting from the use of these drugs is the appearance of gastric ulcers. These drugs have daily variability, as they are better tolerated at night than during the day, due to the melatonin that is synthesyzed in the dark.
Objetivo : This work aims to study and understand the effects of NSAIDs on gastric ulcers
Methods: To understand the effects of NSAIDs on gastric ulcers, 6 articles on the effects of non-steroidal anti-inflammatory drugs were searched and analyzed, of which 4 were chosen to obtain results on the subject.
Results: NSAIDs inhibit the enzyme cyclooxygenase (COX), which is involved in the production of prostaglandins, important molecules in the protection of the gastric mucosa. Reduced production of prostaglandins can cause irritation, inflammation and damage to the gastric mucosa, leading to the development of ulcers.
Some studies suggest that chronic use of NSAIDs significantly increases the risk of gastric ulcers. However, it is important to note that not all people who use NSAIDs develop ulcers and that the severity of the injury varies.
Conclusion: To prevent gastric ulcers associated with the use of NSAIDs, doctors generally recommend the use of gastric mucosal protective drugs such as proton pump inhibitors (PPIs) or H2 receptor antagonists. In addition, it is important to follow the dosage instructions prescribed by the physician and to avoid excessive or prolonged use of NSAIDs, especially if there is a history of gastric ulcers or other gastrointestinal conditions.

Keywords: NSAIDS; GASTRIC; ULCERS;

WARFARIN AND VITAMIN K INTERACTION

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Introduction: Vitamin K is a fat-soluble vitamin being an essential cofactor in humans to produce many proteins. It exists naturally as Vitamin K1 (phylloquinone) and Vitamin K2 (menaquinone) or synthetic as Vitamin K3 (menadione). Warfarin is an indirect anticoagulant, designated as a Vitamin K antagonist. Warfarin exerts an effect, on Vitamin K, necessary to stop the coagulation cascade. So, we try to understand this relationship and the association between Vitamin K intake and the Internationalized Normalized Ratio (INR).

Objective: This article aims to analyze the interaction between Warfarin and Vitamin K, the effects on blood coagulation and the importance of his monitorization.

Methodology: For this article, a literature review was conducted through EFSA, Infarmed, Krause, and Pubmed. Seventeen articles were found from the last nineteen years. After reading them, 8 were selected for a full analysis.

Results: Warfarin has an anticoagulant effect because it inhibits the (VKORC) complex necessary for the reduction of 2,3-epoxy vitamin K into vitamin KH2. The consumption of vitamin K must be normal to have a good coagulation state, because a reduction or an increase in the consumption of this micronutrient may jeopardize therapeutic efficacy.

Compared to patients with a normal vitamin K intake, those with high vitamin K intake had a slightly lower risk of a subtherapeutic INR, and those with low vitamin K intake had a higher risk.

Conclusion: Vitamin K intake should be within the recommended values, so that we have a state of coagulation within normal parameters and warfarin has the intended effect.

Keywords: "Warfarin", “Vitamin K”, “Vitamin K and Warfarin Interaction”, “International Normalized Ratio"

ENDOMETRIOSIS, TREATMENT AND NUTRITIONAL APPROACHES

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Introduction: Endometriosis is a chronic, estrogen-dependent, inflammatory condition, characterized by the implantation of endometrial-like tissue outside the uterus, affecting 6 to 10% of women of reproductive age. The growth of these ectopic lesions is associated with dysmenorrhea, noncyclic pelvic pain, dyspareunia, and other symptoms that significantly affect patient's quality of life.

Objective: To understand the different approaches to endometriosis treatment and to verify if nutritional supplements has the ability to reduce symptoms.

Methodology: Research was conducted on PubMed and ScienceDirect, using the terms: "levonorgestrel", "ethinylestradiol", "vitamins", "endometriosis", "supplements", "diet", "GnRh antagonists", "treatment", and "aromatase inhibitors", filtering the last 10 years, and excluding reviews. A total of 948 articles were obtained, of which 113 were selected by title and 38 were chosen based on their abstract.

Results and discussion: First-line medical therapies for endometriosis-related pain (eg, combined oral contraceptives, progestins) have limited long-term efficacy, and second-line therapies (eg, high-dose progestins, injectable depot formulations of GnRH agonists and GnRH antagonists) are effective but associated with undesired side effects. Before considering surgery, there are therapeutic modalities that can reduce symptoms, such as aromatase inhibitors, dietary supplements, and NSAIDs.

Conclusion: There is an unmet need for an oral, long-term treatment that adequately manages endometriosis symptoms while minimizing negative side effects. Clinical treatment for endometriosis aims to reduce the local inflammation and consequent pain. The available treatments can be indicated alone or complementary to surgery. Pain and inflammation can be reduced by taking vitamin supplements and lifestyle changes. Evidence also indicates a relation between diet and the risk of developing the disease.

Keywords: endometriosis, treatment, diet,supplements, antioxidants

GRAPEFRUIT JUICE AND SOME DRUGS DON'T MIX

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Introduction: Although grapefruit has some health benefits, its consumption simultaneously with certain oral drugs may compromise the bioavailability of the drug and result in adverse effects. Bioavailability may be compromised by an inhibitor of the intestinal and hepatic cytochrome P450 3A4 (CYP 3 A4) system and by the P - pump glycoprotein (Pgp), found at the edge of the intestinal wall.

Objective: Analyze the spectrum of drug interactions with the consumption of grapefruit.

Methods: It was conducted a review through Pubmed using the keywords “Grapefruit”; “Drugs”; “Pharmacokinetic Interaction”. From those, a selection of 12 articles was obtained based on the abstract. After a final analysis, 8 articles remained . Research was restricted for articles from 2000 until today.

Results: The grapefruit presents some properties such as, flavonoid glycosides, furanocoumarins, sesquiterpenes, that block the action of CYP3A4 present in certain drugs, reducing the pre-systemic metabolism of the drug, which will result in an increase in the amount of drug that is absorbed, increasing its bioavailability.

The effect of grapefruit on Pgq, on the other hand, is not so clear, as it varies from activation to inhibition.

If Pgq is activated, there is a greater flow back into the intestinal lumen, decreasing the oral bioavailability of this drug. If it is inhibited, a smaller amount of drug returns to the gut and a larger amount is available for transport through the enterocyte.

Conclusion: More research is needed on how the severity of the interaction may vary from person to person, the medication and the amount of grapefruit ingested.

Keywords: "Grapefruit"; “Drugs”; “Pharmacokinetic Interaction”

XANTHAN GUM: WHAT ARE THE BENEFITS?

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Introduction: Xanthan gum is a common food additive that is used as a thickening, stabilizing, and emulsifying agent. It is a polysaccharide produced by the fermentation of a bacteria called Xanthomonas campestris.

Objective: The aim of this poster is to fully understand what xanthan gum is, its properties and health benefits.

Methodology: A literature review was carried out, using scientific research bases such as "PubMed" and "ScienceDirect", since 2013. Research expressions included: “Xanthan gum” OR “Food additives“ AND “Food technology”. Firstly, 3197 articles were found. After that, 25 articles were chosen by the title. After reading each article carefully, only 13 were chosen.

Results: This food additive is known to have unmatched properties of being non-toxic, water-soluble, biodegradable, biocompatible, thermally stable, immunological agent and stable to pH changes. It imparts amylase resistance as well, and keeps the bolus viscosity stable upon admixing with saliva. Besides that, xanthan gum lowers the blood sugar in diabetic patients. Overall, it offers numerous applications, such as industrial and pharmaceutical applications.

Conclusion: In view of the applications and benefits, xanthan is the most commercially produced industrial gum, as it is a safe and useful food additive, as long as consumed in moderation.

Keywords: "Xanthan gum”; “Food additives“, “Food technology”

PROTEIN BARS WITH TENEBRIO MOLITOR FLOUR

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Introduction: Currently, it is estimated that 2 billion people already consume insects. These are high in protein and essential amino acids and are a good source of essential fatty acids and micronutrients. The flour obtained from the transformation of insects retains all the benefits and takes on a form that can be easily mixed with other ingredients and inserted into recipes, such as snacks. Portugal Bugs® protein bars, which contain Tenebrio molitor flour, are an example.
Objective: To understand the industrial process of Portugal Bugs® protein bars, as well as their nutritional value.
Methodology: During the month of March, a bibliographic search was carried out in the Pubmed database using the keywords “Tenebrio molitor flour”, using articles published from 2013 onwards as inclusion criteria.
In the same month, through contact with Portugal Bugs®, the general flowchart for manufacturing the bars was obtained and, through the website, we collected information on the nutritional composition of each bar, analyzing the list of ingredients and the label.
Results: Through the analysis of the industrial process of the bars we were able to classify them in ultra-processed foods.
Analysis of the composition of the bars allowed us to verify that they are a good source of protein, as well as containing a high fiber content.
Conclusion: Since the snack market is constantly growing and there is consumer demand that is increasingly oriented towards healthy products, the analyzed bars can be an interesting snack, as an alternative to other products currently known on the market.

Keywords: Tenebrio molitor flour

KEFIR: ITS PRODUCTION AND BENEFITS

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Introduction: Kefir is an acidic beverage, slightly alcoholic with a creamy consistency, made through milk fermentation, and its consumption has been associated with several positive health outcomes. The production process occurs through several steps, firstly two types of milk are mixed and a possible integration of aditives can be added to improve its benefic effects and final texture.

Objective: Understand the impact of kefir's composition and its consumption on human health, as well as the different ways of producing kefir and its current offer in the Portuguese market.

Methods: Through a literature review in pubmed 75 articles were found with the words ''kefir'', ''production'' and ''properties'', 15 articles were selected through the title, 6 were excluded through the abstract and 7 articles remained after its full reading. Beside the literature review, a market research was held through e-commerce, in April, which resulted in 19 products analyzed.

Results: Kefir consumption has several benefits on health, such as anti-microbial, anti-carcinogenic, hypocholesterolemic effects, anti-hypertensive, anti-diabetic, immunomodulatory activity, and also improving lactose digestion, although depending on the type of production, artesanal or industrial, raw material and storage condition, interfer on its composition and effects. Artesanal kefir has greater therapeutic potencial due to its microbiological diversity. In contrast, industrial kefir has a promising capacity on disease treatment, however, it is pointed to have a smaller antioxidante and antimicrobial power.

Conclusion: Still, cientific evidence is controversy on this topic, for that reason more research is requested.

Keywords: ''Kefir''; ''Production''; ''Health Benefits''

PEANUT BUTTER: PORTUGUESE MARKET REVIEW

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Introduction: The demand and development of peanut butter has been driven by the while alternative non-meat-based protein sources and their nutritional benefits. Growing peanuts is sustainable, but the production can cause the final products to have different nutritional quality depending on the ingredients added.
Objective: To Analyze and characterize kinds of peanut butter available on the Portuguese market.
Methods: An analysis of 40 Peanut Butters available in the Portuguese market was performed, focusing on the content of fats, sugars, and salt. In addition, a literature search was done on the Google Academic platforms with the keywords: peanut butter, production, technology, nutritional characteristics, composition.
Results: After analysis, we found an average caloric value of 610,3kcal, with the lowest and highest values for Zumub® and EU Nutrition® (560kcal) and Calvé Smooth® (664kcal). For fats, the average was 49,58g, with the minimum being 46g (Zumub®, Myprotein®, HSN®) and the maximum 58g (Calvé smooth®). Regarding sugar content, the average was 5,69g, with the minimum being 3g (VidaCeleiro®) and the maximum 11,5g (Continente smooth®). An average of 0,335g for salt was verified, with the minimum being 0g (Zumub®, MyProtein®, HSN®, Bulk®) and the maximum 1.43g (CemPorcento smooth®). From the peanut butters analysed, 30 have only peanuts in their composition, and the others are made up of salt, sugar, palm oil.
Conclusion: After analysis, we consider Calvé® the worst alternative, due to its high caloric value, highest fat content, and the lowest percentage of peanuts in its composition. The best option is Zumub®.

Keywords: Peanut butter, Production, Technology, Nutritional characteristics, and Composition.

WHEY PROTEIN - FROM THE INDUSTRIAL PROCESS TO CONSUMPTION

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Introduction: Whey is a by-product of the dairy industry resulting from the production of cheese. The discovery of the nutritional advantages of this product revolutionized the food technology sector, allowing the use of this product, previously rejected, for the benefit of human health and the creation of new processes and food products.

Aim: The aim of this work is to study the whole industrial production process of transforming whey into protein products and its uses.

Methods: Scientific research was carried out on the platforms Google Academic, ScienceDirect with the keywords ”proteina do soro do leite”, “production”, “whey protein”, “nutritional properties”.

Results: The proteins present in whey are of high biological value and of these stand out **β**-lactoglobulin, α-lactalbumin, Serum Albumin and Immunoglobulins. Whey Protein is very nutritionally rich and has immense technological applications, presenting several health benefits. We analyzed several types of whey protein from different brands in the Portuguese market and we realized that there is a lot of variety. We analyzed different flavors of Protein Isolates and Protein Concentrates. In general, all products had a similar and rather interesting nutritional composition.

Conclusion: We realize that the market for products based on whey protein is expanding and that there are numerous applicability of this in terms of food technology.

We conclude that this protein is very rich nutritionally and that it can and should be included in all age groups due to its high nutritional value. However, more studies are needed regarding a diet based on animal source proteins.

Keywords: Keywords: “whey protein”; “production”; “health benefits of whey protein”; “technological applications”.

COMPARISON OF INDUSTRIAL PRODUCTION AND NUTRITIONAL VALUE OF CHIPS

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Introduction: In the Portuguese population, the consumption of foods such as snacks, sweets, salty snacks, pizzas, soft drinks, nectars and alcoholic beverages, which should not be part of our daily diet, represent around 21% of total consumption.
In a study carried out by Marktest in 2019, 6372 Portuguese reported having consumed crisps in the last 12 months, which represents 74.4% of residents on the mainland aged 15 or over.
Aim: Analyze different types of crisps, comparing the energy value, lipids, saturated fats, sugars, salt and price, in order to understand if there are significant differences at the nutritional level in the different crisps analyzed.
Methodologies: Data collection was carried out online, on the websites of the product brands. In total, 10 french fries were analyzed. Fries of four different flavors were chosen - ham, original and light - and four brands, two from a supplier and two from a private label. The collection consisted of recording nutritional data, such as energy value, lipids, saturated fatty acids, carbohydrates including sugars, salt and price. The analysis was performed with the aid of the DGS label decoder.
Results: Based on the analysis, a results table was created with data relating to labeling (energy value, lipids, saturated fats, sugars and salt) and price. We noticed that none of the fries stand out in a positive way. The only difference using the DGS label decoder in the MF2 and MP1 ham fries is that the amount of salt is high and in the rest it is medium. However, regarding the other analyzed parameters, there are no significant differences between the different products.
Conclusion: We conclude that despite being light, original or having flavor, none of the fries are nutritionally interesting.

Keywords: chips, nutritional comparison, chips consumption

NUTRITIONAL QUALITY ASSESSMENT OF GRANOLAS COMMERCIALIZED IN PORTUGAL

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Introduction: Health and nutrition concerns have been increasing. The incorporation of cereals in breakfast has been described as beneficial. However, choices made may or may not be the healthiest.

Aim: Compare the nutritional quality of granolas commercialised in Portugal, acknowledging the guidelines for intake of saturated fats, sugars, and salt.

Methods: Nutrition declaration, ingredient statement and price of commercialised granolas were collected. Granolas were classified according to their flavour/ingredients. Aggregate and individual analyses were made and selected per portion values were compared with WHO guidelines.

Results: Forty-five granolas of four varieties were obtained: classic (n=8), chocolate (n=14), fruit (n=9) and nuts (n=14). The median (IQR) number of ingredients was 16 (10-21.5) and 75% had fat, sugar our salt in one of the first three ingredients in the statement. Chocolate granolas had higher saturated fat than classic and nuts granolas, while fruit granolas had higher sugar than the nuts variety. All classic and nuts granolas had a classification of ‘A’ or ‘B’ in the Nutri-Score and some chocolate and fruit granolas were classified as ‘C’ and ‘D’. Some chocolate and fruit granolas revealed contents of saturated fat or sugar per portion (45g) that contribute with approximately 2% to daily energy requirements. Yet, some granolas of the classic and nuts varieties contributed with approximately 7% to 5g daily intake of salt.

Conclusion: Even though considered as part of a healthy lifestyle, not all granolas can be considered healthy. Aggregate and individual analyses indicate the classic and nuts varieties as having the healthiest products.

Keywords: food labelling; granola; healthy diet; ingredient statement; nutrition declaration; nutritional quality.

INFLUENCE OF THE DIFFERENT MANUFACTURING PROCESSES ON DARK CHOCOLATE

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INTRODUCTION: The term cocoa refers to a natural product, while chocolate refers to processed food containing sugar, fat, additives and sometimes milk in addition to cocoa. The food industry produces different types of chocolate, which can be classified as dark, white, or milk chocolate, depending on the manufacturing process [9]. Dark chocolate contains a lower fat and sugar content than the other two types, has five times higher polyphenol and flavonoid content, and may have possible positive effects on human health.
OBJECTIVE: To evaluate how the different manufacturing processes of various chocolates can affect the quality of the product.
METHODOLOGY: The search was conducted in PubMed, ScienceDirect, and Scielo. 620 articles from the last 12 years were obtained, and 28 articles were selected after reading the title. The criterion used was the concordance of the title with the chosen theme. After reading the abstracts of each of these, 26 were chosen as they presented information about pertinent characters that related to the theme in question.
RESULTS: The different steps of the chocolate manufacturing process and the different process parameters adopted can affect the properties of chocolate, which, in turn, determine the characteristics of the final product, and there may be a loss of polyphenols and flavonoids.
CONCLUSION: Dark chocolate is a food with some nutritional interest. Its consumption is recommended in moderation, giving preference to dark chocolate with a higher cocoa content. The industrial processes used to make dark chocolate can effectively affect the quality of the product.

Keywords: “dark chocolate”, “industrial process”

PROTEIN FOOD PRODUCTS: AN ASSET FOR ATHLETES?

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Introduction: The publicity related to protein supplements and food products has increased and there is a growing demand for protein-enriched food products. There are currently several options on the market.

Athletes and exercisers consume protein-rich diets for a variety of reasons. When advised to increase protein intake in the diet, some of these fortified foods may be useful for improving performance and sports training.

Objectives: Nutritional analysis of protein food products with specific nutritional interest for athletes.

Methods: For this study, five protein products were selected (yoghurts, puddings, mousses, bars and milks), and within each we analysed: brand, flavour, price, ingredients, amount of protein per unit and nutritional statement per 100g.

Results: After analysing more than 50 protein-rich foods, the bars were the most expensive and had the highest amount of protein and fat per 100g of food, compared to the other foods analysed. Sugar was less than 5g (per 100g) in most of the products.

Conclusion: The offer of protein products has increased significantly in the Portuguese market, however they do not always have a more interesting nutritional value than the non-protein versions.

Keywords: Athletes, protein, protein supplements, exercisers

RISK BEHAVIORS OF HIGHER EDUCATION STUDENTS

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College students have been pointed out as a population vulnerable to several risk behaviors, which can affect their health and physical and emotional well-being. These behaviors include illicit drug use, excessive alcohol use, risky sexual behavior, and neglect of healthy habits such as diet and physical activity.

Understanding these behaviors and their causes is fundamental to developing effective strategies for prevention and health promotion.

In this paper we will use a questionnaire to survey Portuguese college students, we will also use various sources to make a short approach to the topic in question.

The questionnaire contains questions about the frequency and quantity of alcohol and drug consumption, age of onset of use, risky sexual behavior (such as condom use or not during sexual intercourse), family history of problems related to risky behavior, among others.

In this work carried out in the scope of the Public Health curricular unit we could conclude that young people increasingly present risk behaviors for their health.

We can state that young people do not have good habits regarding physical exercise, which possibly leads to diseases such as obesity.

Keywords: Students; Risky behavior; Health promotion

FOOD SAFETY

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Food Safety is the right of all citizens to easy access to quality food, in sufficient quantity, without compromising other essential needs.
The main objective in carrying out this work is to raise awareness among the population about good hygiene practices both in the preparation and conservation of food, and to make known the risks associated with food insecurity, contributing as future environmental health technicians in preventing the onset of diseases.
To carry out this work, we supported ourselves in the analysis of scientific articles, with the theme of "Food Safety" and in the subsequent collection of data obtained in a short questionnaire, answered by the different age groups.
In the questionnaire about food safety, after it was made available, 92 answers were obtained. According to the data observed, most of the people questioned (72.8%) have knowledge of what food safety is, 93.5% of people are aware of the good basic hygiene
practices before handling food, 68.5% of individuals are not yet aware of how to defrost food, adopting mainly risky behavior. Through the data obtained it is possible to conclude that a large part of the people study use plastic containers for transportation, while glass containers are increasingly being used.
In short, we believe that part of the population is still not fully aware of good hygiene and safety practices about good hygiene and food safety practices. As environmental health technicians we must sensitize people to adopt correct behaviors when it comes to food safety.

Keywords: Health; Food; Hygiene; Awareness

PUBLIC HEALTH AND AGEING

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Aging is a natural and complex process. The WHO concept of "active aging" highlights the importance of health promotion and safety to improve the quality of life of older people.
The aim of this study was to understand the need for interventions to prevent falls and other risks in older people residing in their own homes. A random sample of people aged 65 years and older was studied.
The results of this study conducted with 25 seniors in order to investigate safety in their homes. Most responses came from the central part of the country (64%), while most respondents resided in rural areas (84%),
72% of the elderly did not live alone, 28% lived alone. Only 20% of homes had ramps for mobility impaired. (68%) of homes had steps between the street and the entrance, but only 40% had handrails on the stairs. The age of the housing varied, with the majority (28%) being between 50 and 59 years old. The results indicate that the elderly face challenges of self-care and achievement in daily activities, which may lead to an increased risk of falls, injury, or illness. We realized that installing ramps, handrails, and lighting improvements to ensure their safety and well-being is critical.
In summary, interventions to prevent falls and risks in the elderly residing in their own homes is urgent, not only through professionals, but also with campaigns and other ways to make the population aware of this problem.

Keywords: Elderly; Safety; Risk prevention; Housing

ALCOHOLISM AND DRUG USE IN YOUNG PEOPLE

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During adolescence, young people build their personality and individuality, being also the moment when the use of alcohol and drugs is more frequent. This work aimed to develop a questionnaire on the use of alcohol and drugs among young people, verifying the factors that influence them. In which 46 young people participated in our questionnaire. With the application of the questionnaire, we detected that it is in adolescence that the frequent use of alcoholic beverages and drugs begins, and the main factor for consumption is the influence of friends/groups. There is an increasing consumption of alcohol and drugs among young people, which can have a negative impact on health, leading to chronic non-communicable diseases such as cancer, cardiovascular and gastrointestinal problems. According to our work, we saw that most young people say they consume alcoholic beverages (54%) and (46%) say they do not consume alcoholic beverages. One of the problems that is greatly affecting society is the increase in fatalities and road accidents, due to the use of alcoholic beverages on the roads. The role of the family and family relationships is a fundamental factor that should be better observed and addressed in this process.

Keywords: Alcohol; Adolescence; Influence; Friends; Health

EATING BEHAVIORS IN YOUNG PEOPLE

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Public Health is the science that concerns the epidemiological view of health-disease. This privileges the study of social, economic, educational and environmental factors that can generate pathology

Currently, the diet of young people is increasingly affected by the pressure exerted by society, mainly by the media that influence the consumption of fast foods and industrialized foods through the advertisements carried out.

This work aims to sensitize and alert society, preferably young people, about eating behaviors that affect physically, psychologically and socially.

For the elaboration of this study, we used news surveys, web sites and the realization of a questionnaire that allowed the analysis of knowledge about eating behaviors and the relationship with public health.

The research collected seventy-seven responses from individuals aged between fifteen and twenty-nine years, and most of the participants had only secondary education, the entire sample analyzed understands what a healthy diet is, but a significant part claims not to have a healthy diet, even knowing that bad eating habits are direct consequences of poor diet.

In this way, schools need to play an active role in relation to food education to promote the adoption of healthy eating habits, making these actions help prevent the onset of diseases related to a poor diet and promote a healthier lifestyle.

Keywords: Eating habits; Illness; Awareness; Eating behaviors

SMOKING, SEDENTARY LIFESTYLE, POOR EATING HABITS (UNHEALTHY BEHAVIORS) - HEALTH DETERMINANTS

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The theme addressed in this paper are the determinants of health: smoking, sedentary lifestyle and poor eating habits. This is a current and relevant issue, and the major stra-tegy of the PNS 2021-2030 for health in Portugal is to invest in the determinants of he-alth and well-being, by strengthening the protective factors of health and reducing the risk factors. Inadequate diet is an important health determinant, since it is one of the main causes of chronic diseases, loss of quality of life and premature mortality in Portugal, contributing to 7.3% of DALYs (Disability Adjusted Life Years). According to PAHO (Pan American Health Organization) and WHO, smoking is the le-ading cause of death, disease and impoverishment. According to the NHS, physical inactivity is an important risk factor for the deve-lopment of diseases, such as diabetes, depression, cerebrovascular, oncological, and res-piratory diseases. The general objective of this work is to address smoking, sedentary lifestyle, and poor eating habits (unhealthy behaviors and lifestyles), since these factors, according to the PNS, are considered behavioral determinants with a major impact on public health. We are witnessing a progressive increase in health costs with the serious prevalence of non-communicable diseases related to risk behaviors. We conclude that investment in the prevention of sedentary lifestyles, smoking, and poor eating habits is more justified than ever, thus contributing to individual well-being and public health.

Keywords: Public health; Health; Smoking; Sedentary lifestyle; Diet.

PROMOTING HEALTHY LIFESTYLES

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Having a healthy lifestyle contributes to our complete well-being. This way, a good promotion of the benefits to which this practice leads us is extremely important for the population. Essentially, the regular practice of physical exercise and a healthy diet will result in a great improvement in health and greater prevention of disease.

This study has as its main objective the awareness of the population about the adoption of healthy lifestyles. To monitor part of the community's lifestyles, we opted for the elaboration of a questionnaire with the purpose of obtaining data in order to achieve the objectives, in which 140 people participated.

When analyzing the results obtained, there are still few people who do not practice physical activity or have a balanced diet, however, the majority of the population considers that these two habits influence the psychological well-being of the individual. So, the biggest challenge will be to change the mindset of the community, as they are aware of the consequences of everyday mistakes but don't want to improve their lifestyles.

In short, more assertive lifestyles should be promoted, so that the entire population has access and can successfully achieve it, preventing diseases and consequently improving the quality of life of each one and in general, always placing health as a priority factor.

Keywords: Physical exercise; Health; Daily life; Food; Addictions

CHEMICAL RISK ASSESSMENT - COSHH ESSENTIALS METHODS

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Chemical products present risks throughout their life cycle, whether in production, handling, use, or final destination. In hospitals, several chemical products are used and the workers are exposed to risks by handling and using them. Given the intense concern that hospitals give to assessing the risks that workers are exposed to in their workplaces, the COSHH Essentials method appears as an additional instrument for the prevention and control of chemical risks. It thus makes it possible to systematically identify, understand and analyze chemical risks and their interaction with the worker and the workplace; to implement a systematic and organized process of preventive and corrective measures; and, as a complement to general risk assessments, to eliminate or reduce occupational risks. The COSHH methodology is divided into two fundamental processes: the systematic process (knowing and inventorying the chemicals; and defining actions to control exposure) and the evaluation process (determining toxicity; the quantity used; the spread in the environment; control measures; and implementing specific measures). Always aiming to improve working conditions and safeguarding workers' safety and health, the implementation and use of the COSHH method emerges as an essential tool to complement traditional risk assessment methods.

Keywords: Chemical Risks; Risk Assessment; COSHH Essentials Method ; Hospital Environment

THERMOCHROMIC HELMET

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Head injuries; Safety at work; individual protection equipment, Construction safety at work.
According to the survey from 2020, head injuries made up around 8% of all occupational illnesses and injuries in Portugal. There were 7.141 incidents of head injuries registered overall in 2020. 20 of these incidents were deadly. This amount may seem low but when the number of fatal accidents occurred in 2011-2020 is considered, 24,4% of fatal accidents are caused by head injuries, among all the other parts of the body. Between those years, there were 1,343 fatal incidents, 328 of them were from the head.
With this study, the usability and possible applicability of thermochromic dyes on helmets were desired to investigate to monitor the use of helmets at work sites and to raise awareness among workers. To make the following of workers (whether they are using the helmets as it supposed to be or not) easier, and to make using helmets engaging for them, helmets can be painted by thermochromic dyes. According to the exposure time of the head temperature, helmets can change color totally or according to the situation (such as being exposed to sun rays with high temperatures on open fields or for economical profits) thermochromic stickers with a lesser area can be used inside part of the helmets to obtain this color transformation.
As result, using thermochromic dyes on helmets, one can easily keep track of workers safety and help them to utilize it as it supposed to.

Keywords: Thermochromic Helmet, Construction Site Safety, Thermochromic Sticker

DIVERGENCES REGARDING COCHLEAR IMPLANT

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The following work aims to present the perspectives related to the application of cochlear implants in children with hearing loss and to show the entire application process. To achieve these objectives, a methodology based primarily on research and information gathering was used, which focused on the analysis of online articles and the viewing of videos on the subject. Through this information gathering, it can be observed that cochlear implants, despite being a huge break through in the resolution of hearing loss, still cause a lot of controversy, as there are various opinions for and against the implantation of children with hearing problems. Cochlear implants are invasive devices that are used to restore auditory function, allowing patients to hear again and communicate effectively through speech, which causes some indignation in the deaf community because some of its members believe that by allowing the implantation of their children, they are creating a setback for the recognition of their language and culture. For them, deafness is not a medical disability that needs to be cured but rather a cultural identity that should be accepted and respected by the rest of the people. In summary, it can be said that cochlear implant is undoubtedly a fascinating discovery that has changed the lives of many people, which is increasingly accepted and normalized by society, but still causes some controversy due to its collision with the values of the deaf community.

Keywords: Cochlear Implant, deafness, deaf community

ACCESSIBILITY FOR THE DEAF COMMUNITY IN A NORMAL HEARING POPULATION

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Accessibility, defined as the facility of access of people to goods and services should be one of central concepts in planning, design and intervention, which implies greater effort so that the society allows even mor access of citizens, not only to physical spaces but also to design the city in order to reduce material, cultural and legal obstacles that enhance the enjoyment of urbanity. The concept of deafness is the name given to the impossibility or difficulty of hearing. Objective: The present study aims to deepen further on what are the accessibility difficulties of the deaf community. Methodology: Ten articles from the Web of Science and Google Academic were used, analyzing strategies and accessibility difficulties of the deaf, in school, work and society, with exclusion of normo-hearing people. Results: To problematize the deaf education in the academic context, refers to understand deafness as difference, which, by definition, is conceived by representations in matrices of linguistic, political and cultural meanings. The intellectual capabilities are the same, but the opportunities aren´t the same for listeners and deaf people. The communication barrier imposes limitations and magnifies problems. For a deaf person, entering the job market can be an adventure. Conclusion: Thus, accessibility becomes an important study point, since it enables the socialization of the information, contributing to social and digital inclusion and allowing the integration between different people with audiovisual or physical limitations. Meanwhile, recognizing deafness as a difference implies a fight for the consolidation of the deaf education at this stage of education.

Keywords: Accessibility, deaf community, social inclusion.

COMMUNICATION STRATEGIES WITH DEAF IN THE SCHOOL ENVIRONMENT

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Introduction - At school age it is necessary to adapt teaching and communication methods toward children, because they are the future of our world. The acquisition of communication skills happens in the same way in deaf and hearing children. However, hearing children use oral-auditory language and deaf children use visual-spatial language.
Objective - Understand and analyze which methods and strategies for communicating with deaf people in a school environment.
Methodology - Through the literature review, starting in the year 2000, we searched for articles on the google scholar platform that addressed the communication of deaf children in the school environment, as well as websites and blogs, with the same theme.
Results - The use of strategies such as placing the deaf child further ahead in the classroom, the use of sign language, the use of paper charts with letters and symbols, and cell phone applications will allow a better communication and learning on behalf of the child. In addition, it is essential not to treat the deaf child as someone different or ignore him, you should encourage his participation in class, asking him questions and helping him express his ideas.
Conclusion - It is important to make it known that better school preparation that uses alternative and augmentative communication strategies promotes a more favorable environment for the personal development of deaf children. Every deaf person has their potential, the teacher just has to know how to guide them, taking into account their experiences and culture.

Keywords: Deaf children, Communication, School, Difficulties, Alternative and augmentative communication.

Discipline: Methods of Non-Oral Communication II

Professor: Maria Inês Araujo

Degree: Audiology

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Keywords: Accessibility, deaf community, social inclusion

SIGN LANGUAGE AS A MEANS OF VERBAL COMMUNICATION

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Introduction: The human being has, by nature, the need to communicate, to express what he feels, what he needs and even what he does not like.
As communication is a fundamental act for any human being, it does not cease to be for the deaf person. In some cases, the severity of the hearing loss allows them to develop oral language, but in most cases, there is a need to use other communication alternatives, such as sign language.
Sign Language is the natural language of the deaf community and for all people who live with them. It is a language of manual-motor production and visual reception, composed of gestures and signs that represent words and sentences following its own grammar and logic.
Objective: To understand the impact of sign language on the daily lives of deaf people.
Methodologies: This work was based on a literature review of scientific articles and theses from electronic platforms.
Conclusion: LGP has been increasingly recognized as a language and not just as an alternative form of communication for people in the deaf community.
Sign language is not only a form of communication for people with hearing impairment. It is a means of socialization and integration of this community into their society and as such, it is the duty of society to allow deaf children to learn sign language, as a first language, as well as the mother tongue of their country.

Keywords: hearing impairment, alternative communication, deaf community, sign language

THE DEAF HISTORY

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Over time the deaf have been viewed in different ways around the world. Today there are tools and methods to integrate the deaf community into society, however there are still cases of isolation and discrimination. Much of this evolution is due not only to the willpower and revolutions organized by the deaf community, but also thanks to the listeners who helped drive this evolution. This paper's main objective is to address the history of the deaf and the impact it has on their lives.

A search was made based on Google academic and PubMed, where from 18 articles 8 were selected.

It was observed that at the same time it was possible for several countries to have different ideologies about this population. In Egypt the deaf were considered gods, and in Greece they were treated as incompetent and irrational beings. It was found that over time these perspectives were changing depending on the mentality of the population.

The integration of the deaf community in society has evolved over the years, although there are still barriers to be broken.

This is visible in aspects such as the lack of implementation of sign language in schools and public service, as well as television interpreters, who, despite having more visibility, are not enough.

It is to be hoped that the deaf community will continue to evolve and that, although it is not an easy task, it will manage to prevail with its rights and always continue to make its mark in society.

Keywords: deaf community, history, world, deaf revolution

NITRATE/NITRITE INTAKE: A RISK OR A BENEFIT?

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Introduction: When it comes to the impact on human health, nitrate and other related nitrogen species are a matter of increasing scientific controversy. These compounds are widespread in the environment and occur naturally in foods of plant origin as a part of the nitrogen cycle, being also used as additives to improve food quality and protect itagainst microbial contamination and chemical changes. Currently the acceptable daily intake (ADI) for nitrites is 3.7 mg/kg body weight.

Objective: To understand the risk-benefit of the ingestion of nitrates and nitrites on human health.

Methods: A literature review in PubMed was conducted, in March 2023, and 54 articles were found, 23 of which were initially selected through the title, 4 were excluded through the abstract and 14 remained after a full reading of it.

Results: Within considered studies, most point that nitrate is not toxic, but due to the action of anaerobic bacteria, 5%–20% of its intake is converted to nitrite, which has a certain toxicity. This conversion and further metabolism of nitrogen compounds to nitrosamines is related to negative effects of nitrate like the risk of cancer. However, others report benefits of nitric oxide formed as a result of nitrate conversion, including the control of blood pressure, improving cardiovascular health.

Conclusion: The potential risk-benefit of nitrate intake is still controversial. More studies about this topic are needed to understand if a possible increase in the ADI of nitrate could positively affect human health or not.

Keywords: ‘’Nitrate/nitrite’’; ‘’Risk-Benefit’’; ‘’Toxicity’’

PHTHALATES: A THREAT FOR HEALTH?

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Introduction: Phthalates are chemical substances found in plastic and are present in a wide range of products, including food packaging. Over the last few decades, its toxicity has been studied, since these chemicals are easily released into the air, water and soil, leading to the entire population being at risk of exposure.
Aim: To understand the impact of phthalate contamination on food in human health.
Methods: A comprehensive literature search was carried out on PubMed and ScienceDirect to identify articles on Phthalates published since 2013. 25 articles were chosen by their title and abstract. After reading each article carefully, only 8 were selected.
Results: Phthalates can affect human health in different ways, being correlated to several human cancer, causing malformations in the reproductive system and increasing the risk of chronic diseases. such as cardiovascular disease, diabetes and obesity.
Individual and government measures can and should be taken to reduce the use of plastics and minimize unnecessary exposure to contaminants. Some studies claim that even low chronic exposure to phthalates may still threat long-term health effects, especially in children.
Conclusion: Thus, although there is legislation that regulates the level of phthalates present in products, there is a serious risk of contracting diseases derived from this contamination and, therefore, it is necessary to pay attention to exposure.

Keywords: "Phthalates", “Food additives”, "Toxicology"

THE IMPACT OF MERCURY PRESENT IN FISH ON HUMAN HEALTH

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Introduction: Mercury is a non-essential heavy metal, whose toxicity is a worldwide concern. This reaches the human population, namely through food, mainly fish. Due to its complex immune system, fish are considered vulnerable to exposure to mercury. The harmful health effects caused by this metal extend from the central nervous system, to the kidneys and liver, passing through the heart.

Aim: The aim of this article is to understand the impact of mercury present in the fish on human health.

Methodologies: A bibliographic search was carried in PUBMED, ScienceDirect and Google Scholar databases, since 2016, with the following keywords: “fish toxicity”, “mercury in fish” and “human consumption of mercury". 2514 articles were found. We selected 25 articles, which were considered for full reading.

Results: It was found that the mercury content in fish varies according to their life cycle, increasing directly with their growth in most fish. It was observed that the fish found on the western Atlantic coast have values considerably below the recommended by the World Health Organization. Studies have shown that scientists have set a threshold level of maximum ingested mercury concentration of 0.5 mg/kg.

Conclusion: Fish is the biggest source of mercury in our food, however, its health benefits make it important to consume. Currently, it is possible to define adequate fish consumption values and understand which species have the lowest mercury content.

Keywords: Keywords: “mercury toxicity”, “fish”, “human consumption of fish”.

BISPHENOL A AND CARDIOMETABOLIC HEALTH: A SYSTEMATIC REVIEW

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Introduction:: In the last decades, the prevalence of cardiovascular risk factors has been increasing. Beside traditional aetiology, increasing attention has been given to environmental xenobiotics present in foods, particularly bisphenol A (BPA).
OBJECTIVE: To analyse the most recent empirical literature about the impact of BPA on the various causes of cardiometabolic diseases in diverse population groups.
METHODS: We analyse scientific articles studying the relationship between BPA exposure and cardiometabolic outcomes through a systematic review, following PRISMA guidelines. The outcomes of interest were overweight/obesity, diabetes mellitus (DM), hypertension and cardiovascular diseases (CVD).
RESULTS: Twenty studies met the inclusion criteria. Sample ranged from 101 to 10428 individuals, three studies were prospective and six analysed paediatric subjects. Nine studies reported on overweight/obesity, 6 on DM, 4 on CVD, 1 on hypertension and 1 on metabolic syndrome. In the adult population, positive cross-section associations between urinary BPA and overweight/obesity, DM, hypertension and CVD were found in 2/2, 3/5, 1/1, 4/4 of the studies, respectively. In the paediatric population only a positive association between urinary BPA and overweight/obesity was found in 2/6 of the studies. Two prospective studies reported positive associations between BPA exposure and DM and obesity.
CONCLUSION: There is evidence that adults with higher concentrations of urinary BPA might be more susceptible of developing overweight/obesity, diabetes, hypertension, and CVD than those with lower concentrations. Given the ubiquity of BPA and its potential impact on human health, the development of prospective studies becomes paramount, by distinguishing between different types of ingested food and analysing the cardiometabolic consequences of BPA exposure.

Keywords: Bisphenol A, obesity, hypertension, cardiovascular disease, diabetes mellitus, systematic review

IODINE: FOOD AND SUPPLEMENTATION

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Introduction: Iodine is an essential micronutrient with a crucial role in metabolic functions, such as synthesizing thyroid hormones, besides acting as a bactericide due to its oxidative properties and because of that, it's widely used in medicine, as well as in the food industry.
Methods: Literature review was conducted in the databases PubMed and GoogleScholar. This research was restricted to articles from the last 7 years, combining the keywords: "Iodine", "Toxicity", "Food", "Supplementation" and "Seaweed" articles. After reading the title and abstract of 31 articles, 19 were selected for full reading. From those, only 13 articles were included in this study.
Objective: Analyze the effects of an inadequate consumption of iodine in human health.
Results: Excess of iodine may result in subclinical thyroid dysfunction, especially in patients with risk factors, such as pre-existing thyroid disease and in the elderly. The effects of iodine excess may also result from corrections of iodine deficiency. Due to these issues, health authorities, medical doctors and scientists are developing new and additional strategies to deal with unbalanced iodine intake. It's important to notice that both iodine deficiency and excess may increase the risk of developing disorders such as hypothyroidism and hyperthyroidism, so it's crucial that its consumption is managed through food, such as seaweed, or supplementation.
Conclusion: Both excessive and deficient intake of iodine have a negative impact on the thyroid gland and overall health so its consumption should be kept between the established thresholds.

Keywords: Keywords: "Iodine", "Toxicity", "Food", "Supplementation", "Seaweed"

CADMIUM TOXICITY AND THE PROTECTIVE ROLE OF PROBIOTICS

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Introduction: Cadmium is a toxic heavy metal with no known biological functions in the human body. Exposure occurs primarily via inhalation or ingestion. After ingestion, Cd is absorbed and subsequently transported throughout the body, accumulating throughout life with a clearance half-life of 25 to 30 years, with very slow excretion.
Recent studies suggest that probiotics can attenuate experimentally induced cadmium toxicity in animals.
Objective: To understand what impact Cd intoxication can have on different organs and the role of probiotics in this intoxication.
Methodology: A bibliographic search was carried out in Pubmed, using the keywords “cadmium” and “cadmium toxicity”, using articles published from 2013 onwards as inclusion criteria.
Results: Cadmium toxicity has been demonstrated in several studies, since its long-term accumulation compromises the normal functioning of various organs. Recent studies suggest that some probiotics bind to Cd in the intestinal tract, absorb it and protect the intestinal membrane, leading to decreased systemic absorption and reduced accumulation of Cd in tissues, which in turn promotes increased excretion of Cd of the tract by the faeces.
Conclusion: Cd is one of the most toxic elements to which humans can be exposed, being associated with several diseases. Probiotics seem to have a protective role in this intoxication, so their use may be a good approach to neutralize the negative effects of Cd.

Keywords: “cadmium”; “cadmium toxicity”

ACRYLAMIDE INTAKE IN FOOD

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Introduction: Acrylamide (AA) is an important manufacturing chemical agent that is used for producing polymers and copolymers. AA is formed in food when high carbohydrate foods are prepared at high-temperature (>120 ºC) processing such as cooking, frying, toasting, roasting or baking. It happens when amino acid asparagine reacts with sugars especially glucose and fructose as a result of the Maillard reaction. Potato products, coffee, and bakery products are the most important sources.

Objective: To synthesize the total daily intake of acrylamide in foods exposed to high temperatures.

Methodology: A literature search was conducted on Google Academic database using the keywords “Acrylamide", "Food", "Toxicity", “Trials” restricted to the last 5 years. A total of 3250 articles were found, of which 25 were selected for analysis after reading the title and the abstract.

Results: Acrylamide is recurrently detected in foods such as French fries, chocolate cereals and cracker cookies. The highest values were found in French fries, whether home-made or packaged. Despite this, the acrylamide values per kilogram were lower than those monitored by EFSA. When compared to the maximum legislated values, the results obtained were also lower.

Conclusion: Exposure to acrylamide is inevitable due to the high content in some foods, so it is very important to prioritize and know its effects and toxic mechanisms, considering its effect on human health. In this sense, more studies are needed to find more appropriate and practical solutions to decrease the formation of this compound and to reduce consumer exposure.

Keywords: "Acrylamide", "Food", "Toxicity", “Trials”

TOXICITY ASSOCIATED WITH ALCOHOL CONSUMPTION IN ADOLESCENTS

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Introduction: Ethanol, the main alcohol present in alcoholic beverages, is a toxic psychoactive substance that causes dependence, and is widely consumed in adolescence. Besides being devoid of proteins, minerals and vitamins, it inhibits the normal absorption and use of some vital nutrients, affecting nutrition. Being mostly a source of energy, its regular consumption can contribute to weight gain, obesity and to the impairment of the liver and gastrointestinal tract, increasing the risk for other diseases.

Objective: To understand the relationship between adolescent alcohol consumption and its nutritional and consequent health risks.

Methods: The research was carried out on PubMed and Google Scholar using "Alcohol", “Nutrition”, “Toxic”, “Adolescents” and “Ethanol” as key-words. After reading the titles and abstracts, the most relevant articles were selected. The search was restricted to articles from 2014 forward.

Results: Excessive and frequent alcohol consumption by young people is associated with the potential development of addictive behaviours. At the same time, there may be damage to the organs involved in the digestion, absorption and processing of nutrients, potentially causing nutritional deficiencies. Many studies also mention that it can interfere with the sleep cycle, promote dehydration, affect growth and muscle recovery.

Conclusion: Studies show that despite the harmful effects of excessive alcohol intake and its negative impact on adolescents' nutritional health, its consumption is still quite prevalent.

Keywords: "Alcohol"; “Nutrition”; “Toxic”; “Ethanol’’; “Adolescents”

IMPLEMENTATION OF FOOD SAFETY MANAGEMENT SYSTEM CERTIFICATION BENCHMARKS

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Consumers are more concerned about the food they eat, stemming from food incidents that have led to consumer distrust in the quality and safety of food. The implementation of Quality and Food Safety Management Systems is important in ensuring food quality and safety. Therefore, organizations are increasingly interested in implementing and certifying the benchmarks that best fit their industry.

The objective of this paper is to understand how the implementation of food safety management system certification standards benefits companies. A literature review on the subject was carried out, and a questionnaire was applied to 3 companies.

The companies surveyed have ISO 22000:2018, HACCP, ISO90001, ISO14001, ISO 22000, ISSO 45001, IFS Food, which show advantages such as improved image, guaranteed food safety, regulatory compliance, improved quality, traceability, reduced costs, and increased competitiveness. The companies obtained the certifications through community support and certification through SGS. At the consumer level, it conveys a greater sense of security by showing legislative compliance. At the environmental level, it ensures that functional activities do not harm the natural environment, facilitating the correct management of resources and waste. At the organizational level, it allows the company to stay informed, facilitating compliance with the benchmarks, involving the whole team and improving the quality and level of response to the customer.

In conclusion, the implementation of standards for certification of food safety management systems proves to be a good tool for the operation of its activity.

Keywords: Standards; Legislation; Food safety; Certification

FOOD CERTIFICATION- LEVEL OF KNOWLEDGE OF HIGHER EDUCATION STUDENTS

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Food certification is a set of measures that must be adopted by the food industry and food services in order to ensure the sanitary quality and compliance of food with technical regulations. Nowadays, the safety of food products is a major concern for citizens and entities in the food and catering sector, and it is a necessary condition for consumer protection.

The objective of our work is to evaluate the university population's knowledge about food certification, for which a literature review and a questionnaire on "Level of knowledge about food certification" were carried out.

Through the population questionnaire it was possible to see that 85.7% of the population knows that Food Certification is a process that guarantees that food meets certain standards of quality, food safety, origin, environment, and animal welfare, but only 52.4% know what the objectives of Food Certification are.

The conclusion is that the purchase of products from the population is not due to the fact that there is or there is not a certification seal, but that the respondents know the importance of the existence of this seal.

Keywords: Food certification; Population; Knowledge; Food; Food safety

THE IMPORTANCE OF CERTIFICATION IN A RESTAURANT

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Safe food is essential for life, health and well-being, and fundamental to the promotion of public health. It is of utmost importance to ensure the availability and consumption of healthy and quality food. The bet on quality and safety will necessarily have to be the main strategy to be followed by catering operators who want to continue to be present, credibly, in the market.

With this scientific article aims to understand the level of knowledge and interest of various catering entities in Coimbra for the certification of establishments, as well as compare the responses of each site and also assess the knowledge of the population with regard to food certification.

In carrying out this work, the methods used were based on a literature review of the subject and the subsequent data collection, through two questionnaires (in online format) to a sample of catering establishments in the municipality of Coimbra, namely Fórum Coimbra. The second questionnaire is directed to the general population, in order to acquire various points of view for our research.

Through the results obtained in the survey to the 4 catering establishments we can verify that all respondents are aware of what food certification is and that their establishment has implemented food certification standards. In addition, 75% consider that there were advantages in the acquisition of certification standards. The survey of the population obtained 27 responses, and unlike the previous survey, most respondents, 70.4%, have no notion of what food certification is, but there is knowledge, 84.5%, predominant that the quality of the establishment as well as the food safety of the same is interconnected with certification.

In conclusion, food certification is crucial to food safety and food quality in catering establishments, and can be critical to business success.

Keywords: Food safety; Certification

COMMOTIO CORDIS

Pedro Lameiras; Ana Carolina Santos

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Commotio Cordis (from the latin agitation of the heart) is a type of tachyarrhythmia caused by a blunt non penetrating blow directly over the heart in the beginning of ventricular repolarization (upstroke half of T-wave in electrocardiogram), leading to an activation of mechanoreceptors that generate a second contraction before completion of the previous total repolarization of the heart. As a result, ventricular fibrillation begins, and in most cases ends in death. Most cases occur from round and hard objects impact on the sternum or on the left side of the thorax. There are mentioned cases involving baseball or lacrosse balls, hockey disk, and other objects, and in martial arts, but none impact sport is exempted from the risk of an impact generating Commotio Cordis. Epidemiologically, the frequency of Commotio Cordis is quite low because it demands the combination of structural conditions, point of impact and precise moment in the cardiac cycle. It has higher prevalence among children to young adults. With a sharp reduction of cases above 20 years of age, probably associated to the thinner structure of thoracic wall in younger people, and occurs mostly among men. In the occurrence of Commotio Cordis the probability of death is high, although using of an Automated External Defibrillator in the first three minutes after beginning of symptoms raises the change of survival.

Keywords: Commotio Cordis; Tachyarrhythmia; Ventricular repolarization; Ventricular fibrillation

TAKOTSUBO SYNDROME

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Takotsubo syndrome, also known as broken heart syndrome or stress cardiomyopathy, can occur when a patient faces a stressful emotional or physical event that causes the left ventricle of the heart to dilate, leading to acute heart failure.

The signs and symptoms of this syndrome are similar to those of other cardiac syndromes, such as acute myocardial infarction, which makes it challenging to distinguish between them.

Although it was initially thought to be a benign, self-limiting condition, recent studies have shown that many patients with this condition continue to experience limiting symptoms even after the restoration of the left ventricle ejection fraction, indicating ongoing cardiac dysfunction.

The underlying etiology and pathophysiology of Takotsubo syndrome are still not fully understood by the medical community, leading to a lack of treatment based on strong evidence, making it difficult to prevent major cardiac events that can occur due to this syndrome. The pathophysiology is complex and may involve the brain-heart axis and neuro-hormonal stunning of the myocardium, microvascular ischemia, and left ventricular outlet tract obstruction, among other factors.

Keywords: Takotsubo syndrome; Acute heart failure; Cardiac symptoms; Pathophysiology; lLeft ventricular dysfunction

SUDDEN DEATH IN ATHLETES

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Athletes are often regarded as individuals at the pinnacle of health and fitness, nearly to the point of invincibility. Sudden cardiac death (SCD) is a tragedy at any age and under any circumstances but is perhaps most tragic when it claims the life of the athlete, because it is generally unexpected and extremely traumatic.

Most cases of sudden death in athletes occur during or immediately after the exercise, which suggests the importance of pre-participation screening, proper training, and emergency response planning.Some of the most commonly identified causes of SCD in athletes include the genetic heart diseases. The main causes of death in athletes are hypertrophic cardiomyopathy, arrhythmogenic right ventricular dysplasia, congenital coronary anomalies (in >75% the initial onset is sudden death), channelopathies (Brugada syndrome, long QT syndrome and polymorphic ventricular tachycardia catecholaminergic), comotio cordis (occurrence of ventricular fibrillation resulting from chest trauma), myocarditis and Marfan syndrome. SCD could be prevented and minimized by understanding the causes and mechanisms of such events. In the younger athlete, pre-participation screening with history (including family history), physical examination and ECG should help identify those at high risk for SCD and a detailed evaluation by a cardiologist can be considered for those suspected of heart disease or risk on initial screening. The older athlete is more likely to suffer SCD than the younger athlete; and since coronary artery disease (CAD) is the most frequent cause for such events, their pre-participation screening should include evaluation for coronary risk factors and when necessary a stress test.

It is important to recognize the risk of sudden death and understand that its causes can vary according to age. Often, cases of sudden cardiac death are preceded by warning signs or symptoms that we must always be aware of.

Keywords: Athlete; Sudden Cardic Death; Heart disease

MAGNETIC RESONANCE IN CARDIOLOGY

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The Cardiac Magnetic Resonance is a diagnostic exam performed in the cardiology clinical routine, it is used to assist the cardiologist in the diagnosis of diverse pathologies and in the morphological, structural and functional evaluation of the heart.

The Cardiac Magnetic Resonance works through the generation of an intense magnetic field and radio waves, in order to obtain images of the heart. This technique is also used in other organs of the human body.

This is a non invasive image exam, which does not use radiation and provides clinical information about certain pathologies, like ischemic cardiopathy, non ischemic cardiomyopathy, cardiac insufficiency, overcharge evaluation and quantification or iron myocardial infiltration, and others.

Even though the exam can be done without contrast, when used, it allows to study the vascular behaviour of the heart. The contrast used is Gadolinium which is administered by intravenous route.

When the patient arrives, he has to change his clothes for an overall and take off all types of metallic objects he has with him. Then, the radiologist technique has to position the patient on the table which will guide him through the Magnetic Resonance machine, beginning the exam.

However, this exam has some contraindications which are similar to the basic Magnetic Resonance. The patient can not have metal in his body, for example Pacemakers or Stents, kidney problems or kidney dialysis, and others.

Keywords: Cardiac Magnetic Resonance, Contraindications, Pathologies, Diagnosis

VENTRICULAR FIBRILLATION

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Ventricular fibrillation (VF), is considered the most serious cardiac arrhythmias, which leads to cardiac function loss and sudden death. Disordered electrical activity causes the ventricles to quiver (or fibrillate) instead of contracting normally. This prevents the heart from pumping blood, causing collapse and cardiac arrest.

VF has been identified in nearly 70% of cardiac arrest patients. Without treatment, the condition is fatal within minutes. The rates of survival for VF patients outside the hospitals have increased slightly however many are left with residual anoxic brain damage and neurological deficits.

Due to challenges in safely mapping VF, a comprehensive understanding of its mechanisms remains elusive.

51 year old man clinical case that had developed ventricular fibrillation after presenting to the emergency department with chest pain and shortness of breath.

Keywords: Ventricular fibrillation; Cardiac arrhythmia; Sudden death; Electrical disorder.

WOLFF-PARKINSON-WHITE SYNDROME

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Wolff-Parkinson-White syndrome is characterized by the presence of an accessory pathway (PA) for atrioventricular conduction. Therefore, the impulse can be conducted through the AV node and/or the PA (more quickly), causing early ventricular activation and, as a consequence, pre-excitation. This pre-excitation causes tachycardias as well as arrhythmias, reducing heart´s efficiency.

A classification for the WPW syndrome has been developed based on the location of the accessory pathway (Type A and Type B).

The diagnosis of this syndrome is based on electrocardiographic findings and usually occurs in routine exams, since in most patients it does not cause symptoms. WPW syndrome symptoms are usually due to tachyarrhythmias and can include palpitations, discomfort and even pre-syncope.

Usually, therapeutic options apply only to symptomatic patients, and are dependent on the patient's assessment, whether pharmacological, surgical or catheter ablation, being the last one the most common and with the highest success rate.

In our clinical case, we evaluated the ECG of a 20-year-old student who had irregular palpitations, followed by dyspnea and fatigue.

Keywords: Wolff-Parkinson-White Syndrome; Accessory pathway; Electrocardiographic findings

HYPERTROPHIC MYOCARDIOPATHY

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Hypertrophic Myocardiopathy is the most common cardiomyopathy and the most frequent cause of sudden cardiac death in young people. The presentation ranges from asymptomatic to the presence of symptoms of heart failure.

At rest, the physical examination may be normal. Auscultation along the left sternal border when the patient is in the orthostatic position after a brief period of exercise may reveal a murmur.

There may be a family history. It has a benign prognosis in most patients. Drug therapy with beta-blockers, calcium channel blockers or disopyramide is used in symptomatic patients. There is a subset of patients at high risk for sudden death who should receive a defibrillator implant.

In this paper we present an ECG of a 35-year-old man who was seen with chest pain on exertion, and sometimes exertion-induced vertigo. The examination demonstrates an anterolateral T-wave inversion without ST-segment elevation, and he had no other criteria for left ventricular overload.

In conclusion, Hypertrophic Myocardiopathy is a congenital or acquired disease characterized by intense ventricular overload and with diastolic dysfunction whose diagnosis can be made by ECG and/or MRI.

Keywords: Hypertrophic Myocardiopathy, Electrophysiological study, Sudden cardiac death, Left ventricular overload

ARTERIAL HYPERTENSION IN PREGNANCY

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Blood pressure is the pressure that blood exerts on the walls of arteries, with normal values being approximately 120 mmHg (systolic) and 80 mmHg (diastolic). When values are elevated (>140/90 mmHg), we speak of hypertension.

Hypertension during pregnancy is more common after 20 weeks of gestation and can occur in different ways: chronic or pre-existing hypertension, gestational hypertension, eclampsia and preeclampsia, which will be the focus of our case study. Hypertension during pregnancy is the second most common cause of death. Some factors contribute to the increased risk of this disease, including: being over 35 years old, being pregnant for the first time, diseases such as obesity and/or diabetes, and an unbalanced diet.

To prevent hypertension during pregnancy, the pregnant woman should: avoid strenuous efforts, drink a moderate amount of water, exercise, have a careful and balanced diet with low salt and fried foods, but ensuring the intake of vitamins and calcium, and avoid drinking coffee, alcohol or smoking.

Many of the medications commonly used to treat hypertension are contraindicated during pregnancy, which makes controlling blood pressure during gestation a more complicated task. As an abnormal reduction in blood pressure occurs, this leads to a severe reduction in blood flow to the placenta, which can bring about various serious complications in pregnancy, including premature birth, premature detachment of the placenta, or even fetal death.

Keywords: Pregnancy, Hypertension, Preeclampsia.

ATRIAL FIBRILLATION

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Atrial fibrillation is a common heart disease where there is an abnormal heart rhythm or arrhythmia causing the heart to beat at a fast rate.

In atrial fibrillation, the atria (upper chambers) of the heart contract randomly, irregularly and out of sync with the ventricles (lower chambers), reducing the heart´s efficiency and performance.

People with this condition can show no symptoms but can also experience palpitations, tiredness, chest pain, shortness of breath, finding it hard to exercise and dizziness.

Although it is not life threatening, it is a serious condition that should be treated through medications, ablation, cardioversion and a pacemaker in order to prevent and reduce the risks of a stroke. A healthy lifestyle should not be forgotten as it also plays an important part in the treatment of patients, who can continue to live their lives normally.

This condition can be diagnosed firstly by the patient having a pulse with no set pattern, it can also go and come seeming to be normal at times and irregular at another time. Additionally, a doctor can request further tests such as ECG, echocardiogram, chest x-ray and blood tests to confirm the diagnosis of atrial fibrillation.

Keywords: Atrial fibrillation; Palpitations; Arrhythmia

BRUGADA SÍNDROME

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Brugada Syndrome is a hereditary heart disease, with dominant autonomic transmission, characterized by changes in heart activity, such as ventricular fibrillation or polymorphic ventricular tachycardia. It affects mostly males, between 40 and 45 years old, of Asian descent.
These episodes can be triggered by certain drugs, including sodium channel blockers, beta-blockers, tricyclic antidepressants, lithium and cocaine. Most alterations (18-30%) are related to the SCN5A gene, responsible for encoding the voltage-gated sodium channel alpha subunit in the heart.
This syndrome can cause various symptoms, such as dizziness, fainting, difficulty breathing and in more severe cases it can lead to sudden death.
Its diagnosis is based on an electrocardiographic pattern with an elevation of the ST segment (≥ 2mm), followed by a negative T wave (≥ 1mm) in the right precordial leads V1, V2 and V3 (with QRS complexes similar to right bundle branch block in these derivations).
The most used treatment is the implantation of a cardio-defibrillator, a device responsible for monitoring and correcting the heartbeat 24 hours a day. Other treatments used are: radiofrequency ablation with catheters and administration of antiarrhythmics.

Keywords: Brugada, Ventricular fibrillation, Polymorphic ventricular tachycardia, Sudden death

VASO-VAGAL SYNCOPE

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Among the syncope family, the Vaso-Vagal Syncope is the most common form of Reflex Syncope, affecting all ages. Reflex Syncope describes any type of syncope episode caused by disturbances in the Blood Pressure autoregulation system and by decreased Cerebral Perfusion (Cerebral Hypoperfusion) resulting in hypotension and transient loss of consciousness and postural tone, followed by spontaneous recovery.

This event is usually associated with a wide variety of triggers, such as orthostatic stress, emotional stress, profound pain, or dehydration, which lead to activation of the Parasympathetic Nervous System.

The associated causes are not yet known, however, they can be described as a reflex arc. Increased parasympathetic activity in the Sinoauricular Node and AV Node will cause a decrease in Heart Rate. Simultaneously, the decrease in sympathetic activity results in a decrease in vascular tone. This will result in a decrease in preload, venous return and ventricular volume, which subsequently causes a drop in the patient's blood pressure. When the blood pressure falls below the body's ability to self-regulate, the patient loses consciousness.

Typically, these events are preceded by prodromal symptoms, and when asked, patients report blurred vision, excessive sweating, nausea, dizziness, and weakness.

Keywords: Syncope; Blood; Pressure

PERICARDITIS

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Pericarditis is an inflammation of the pericardium, which is the membrane that surrounds the heart. It can be caused by various conditions, such as infections, autoimmune diseases or trauma. Idiopathic acute pericarditis is a type of pericarditis in which the cause of the inflammation is unknown. It usually presents suddenly and can cause chest pain, fever, and other symptoms.

The electrocardiogram is an important tool for diagnosing pericarditis, as it can reveal characteristic changes that are often present in this condition. Some of the common ECG findings in pericarditis include: Diffuse ST segment elevation, PR segment depression and T wave inversion. It's important to note that these findings are not specific to pericarditis, and can be seen in other conditions as well.

The diagnosis should be based on a combination of clinical symptoms, physical exam findings, imaging tests (such as echocardiogram) and electrocardiogram changes.

The treatment of pericarditis depends on the underlying cause. In idiopathic acute pericarditis, the goal of treatment is to relieve symptoms and prevent complications. This may include rest, anti-inflammatory medications, pain relievers, and in severe cases, drainage of accumulated pericardial fluid.

COVID-19 has been associated with a variety of cardiac manifestations. Myocarditis and pericarditis have been reported as one of the many cardiac manifestations in association with COVID-19.

Keywords: Pericardium; Pericarditis; Acute Pericarditis; Electrocardiogram; COVID-19

TORSADO DE POINTES

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Torsado de Pointes (TdP) is the name given to a subtype of Polymorphic Ventricular Tachycardia, which has a typical and peculiar morphology, and occurs particularly in individuals with prolonged QT interval.

Polymorphic ventricular tachycardia is characterized by a heart rate greater than 100 bpm originating in one of the ventricles, in which the morphologies of the QRS complexes are different between each other.

When it is prolonged the QT interval (≥ 440 ms in men and ≥ 460 ms in women) is called long QT syndrome. This can be congenital, the person was born with an extended QT interval and is predisposed to develop TdP, or acquired through the use of certain drugs.

Although it is not a common tachyarrhythmia, TdP has some peculiarities such as the fact that it is potentially fatal, as it results in hemodynamic instability, degeneration to ventricular fibrillation, which can lead to cardiorespiratory arrest.In some cases, it ceases spontaneously, in others it causes sudden death.

Symptoms such as palpitations, vertigo, dizziness and syncope are frequently reported, however, many of those who experience TdP are asymptomatic.

Unstable patients with TdP should undergo electrical defibrillation, it is not possible to perform cardioversion since the morphology between each QRS is different, and therefore there is no way to synchronize them.

Stable patients, on the other hand, should correct electrolyte disturbances and drugs that may be related to an increase in the QT interval. First-line treatment is intravenous magnesium sulfate.

Keywords: Torsado de Pointes; Polymorphic Ventricular Tachycardia; Long QT syndrome.

POSITRON EMISSION TOMOGRAPHY

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Cardiovascular disease is one of the most common causes of death in the world nowadays. In the last two decades the evaluation of patients with this pathology has undergone several changes and PET (Positron Emission Tomography) cardiac has been important to diagnose and quantify the risk of these patients. PET (Positron Emission Tomography) is a medical imaging technique that, through the administration of radiopharmaceuticals, allows the detection of biochemical reactions associated with various diseases, whether in the area of neurology, cardiology or oncology. In the field of cardiology, this radiological examination is used to quantify the flow of coronary blood and also to identify areas of ischemia and in the metabolic evaluation of the heart muscle and myocardial viability. This myocardial viability is usually studied by PET associated with computed tomography, based on differences in tissue glucose metabolism between different segments of the left ventricle.

In conclusion, when compared to other imaging methods, the evaluation of these parameters by cardiac PET (Positron Emission Tomography) allows a better characterization of cardiovascular diseases, namely coronary artery disease.

Keywords: Cardiac PET; Cardiology; Ischemia; Cardiovascular diseases; Coronary artery disease

PERICARDIAL EFFUSION

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The presentation of a patient with a pericardial effusion can range from an incidental finding to a life-threatening emergency. This syndrome causes great concern in doctors and patients due to its possible progression to Cardiac Tamponade.

Pericardial effusion is characterised by the abnormal accumulation of fluid in the pericardial cavity, which under normal conditions does not exceed 50ml. It can be classified according to their size, duration, composition, distribution, etiology and hemodynamic impact.

Some of the possible conditions responsible for the development of pericardial effusion encompass pericardial fluid overproduction, which is actually the case of ongoing pericardial inflammation, trauma, decreased reabsorption mainly due to neoplastic invasion of lymphatic vessels, and finally an imbalance between hydrostatic and colloid osmotic pressures, frequent in cases of heart failure, liver cirrhosis and nephrotic syndrome.

Echocardiography is the mainstay for the diagnosis, but the initial approach to the patient also includes performing an electrocardiogram. Common electrocardiographic findings are a decreased QRS complex and, in larger strokes, the QRS complex also presents electrical alternans. The PR segment depression may be suggestive of this condition, but cannot be used as a diagnosis.

Keywords: Pericardial Effusion, Cardiac Tamponade, Pericardial fluid, Eletrical alternans

ASTHMA MECHANISMS AND RESPIRATORY FUNCTIONAL TESTS

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Asthma is an obstructive disease resulting from inflammation of the airways and affecting about 100 000000 people worldwide: 5% of the adults and 10% of the children. The main symptoms of it are: dry cough, shortness of breath, tachycardia, wheezing and tachypnea. In addition, asthma can be extrinsic/allergic, caused by the inhalation of allergens, or can be intrinsic/non-allergic which is provoked by a nonallergic stimuli (environmental factors).

This chronic disease is diagnosed by respiratory functional tests that help in the treatment evaluation, allowing to elaborate the diagnosis and trying to prevent this disease. Some examples are: spirometry (Tiffeneau Index), peak flow meter and exhaled nitric oxide test. The most important thing about these tests, in general, are the measures of the amount of the air that a person can blow per second.

The asthmatic inflammatory response starts by inhaling an antigen that stimulates the differentiation of B lymphocytes into plasmocytes, through the release of cytokines by T lymphocytes and the production of IgE antibodies. In consequence, it will activate the mediators that trigger a response. This process results in bronchoconstriction, inflammation, airway hyperresponsiveness and remodeling .

Although this disease has no cure, it can be treated by the administration of bronchodilators, antihistamines, corticosteroids, anticholinergics and others medicines, or by the respiratory physiotherapy, where are used techniques such as pulmonary expansion therapy, bronchial hygiene, "directed cough"postural drainage and respiratory kinesiotherapy.

Keywords: Obstructive disease, Asthma mechanisms, Spirometry, Inflammatory response, Inflammatory mediators

ERYTHROPOIETIN – PHYSIOLOGY AND PATHOPHYSIOLOGY OF ABUSE

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The main stimulus for red cell production at low oxygen levels is erythropoietin (EPO). This glycoprotein hormone stimulates red blood cell differentiation and proliferation by contacting specific EPO receptors on different cell types. Most EPO is secreted by the kidneys and, to a lesser extent, by the liver.

Erythropoiesis, the process by which cells proliferate and differentiate into red blood cells, is necessary because of the normal renewal of cells in the blood and lymphoid tissues. Erythropoiesis balances the continuous destruction of aged or damaged red blood cells by macrophages in the bone marrow, spleen, and liver.

This ability to stimulate red blood cell production, thus increasing oxygen levels to the tissues and muscles, results in improved aerobic exercise competence, thus increasing exercise endurance. In an attempt to obtain better results, many athletes end up using doping strategies, thus putting their physical integrity at risk. Given this situation, methods have been developed to detect the use of this substance, in order to identify it and also to discourage its abuse.

EPO levels are regulated by hypoxic situations, and are very sensitive to altitude, as well as to certain pathological and physiological conditions.

Abnormal EPO levels can lead to pathologies such as anemia, chronic renal failure, and thrombosis, among others.

Keywords: Erythropoietin (EPO); erythropoiesis; doping; exercise

HEMOPHILIA

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Hemophilia is a hereditary degenerative disease which deregulates the coagulation of the blood. People with hemophilia have low level of factor VIII (Hemophilia A) or IX (Hemophilia B) what translates in an increase of spontaneous bleeding. Some other symptoms caused by hemophilia are purple skin marks; prolonged cicatrization; swelling of the joints and excessive menstruation, in some rare cases hemophilia might be fatal.

By being directly hared in a recessive trace of the X chromosome, this disease affects specially men and it can be diagnosed by a blood test that determines if the person's clotting is abnormally slow and measures factor VIII and IX levels.

Although it´s normally a hereditary disease 30% of confirmed hemophilia cases are developed by spontaneous mutations.

Hemophilia has no cure. Though, preventive treatment may consist of periodic replacement of clotting factors so that they are always at increased levels in the body. This type of treatment may not be necessary in cases of mild hemophilia and it may be recommended to have the treatment only when there is some type of haemorrhage.

Keywords: Hemophilia, coagulation, blood test, factors IX and X.

REGULATORS AND COAGULATION CHANGES | VITAMIN K AND ANTICOAGULANTS

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Coagulation is the process by which a blood clot forms to reduce blood loss after damage to a blood vessel. Several components of the coagulation cascade, including cellular (eg, platelets) and protein (eg, fibrin) components, are involved in vascular repair. The role of cellular and protein components can be divided into primary hemostasis (platelet embolism) and secondary hemostasis (coagulation cascade). The coagulation cascade is classically divided into three pathways: the intrinsic pathway, the extrinsic pathway, and the common pathway. Both contact pathways and tissue factor feed and activate common pathways.

Regulation of this process is necessary in order to simultaneously counteract excessive blood loss and prevent intravascular thrombosis.

Vitamin K is a cofactor required to make factors II, VII, IX, and X functional. A vitamin K deficiency may occur when a sufficient amount of vitamin K is not absorbed from foods or when not enough foods with vitamin K are consumed (e.g., leafy dark green vegetables like spinach). Therefore, vitamin K deficiency affects all three pathways.

Anticoagulants are chemical substances that interfere with the normal clotting mechanisms of blood. They prevent the formation or growth of blood clots by inhibiting specific clotting factors or enzymes involved in the clotting process. Protein C, protein S, and antithrombin III are naturally occurring anticoagulant proteins. Activated protein C and protein S act by inhibiting the action of the cofactors factor Va and factor VIIIa. Antithrombin III inhibits the serine proteases (factors II, IX, X, XI, and XII).

Keywords: regulation, coagulation, vitamin K, anticoagulants

AUTOIMMUNE DISEASES

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The function of the immune system is to protect our bodies from outside microorganisms by producing antibodies. Proteins called antibodies are responsible for recognizing and destroying invading agents of infection. In autoimmune diseases, because foreign antigens resemble self-antigens, antibodies attack the cells of one's own body, tissues, and organs. In the presence of autoimmune diseases, the body produces antibodies against its own cells through T-cell-activated B lymphocytes.

These can be classified according to the place where it occurs, being of the systemic type when the immune system acts on antigens and cells of various tissues (rheumatoid arthritis known as chronic inflammatory disease that can attack multiple organs and tissues, with preference being given to the joints and those of the upper and lower limbs. When you have arthritis in a joint, the joint is reddened, swollen, and hot. It's already called an organ-specific when the immune system will only act on antigens and specific cells, and according to the type of immune response being subclassified as Humoral where autoantibodies act by triggering autoimmune disease (Graves' disease is the cause of hyperthyroidism, where there is an improper functioning of the thyroid gland where it overproduces thyroid hormones and the immune system produces antibodies (TRAb) against the thyroid where these attack the TSH receptors) and in Cellphone where autoreactive T lymphocytes trigger autoimmune disease (Type I diabetes mellitus due to the uncontrolled production of antibodies against our cells, specifically against the beta cells in the pancreas that are responsible for producing insulin).

Keywords: immune system;antibodies;antigens;lymphocytes

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A 97

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

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The renin, angiotensin and aldosterone system is a hormonal mechanism that regulates blood pressure. When renin is produced in the kidneys, it's released into the bloodstream and will cleave the angiotensinogen into Angiotensin I and Angiotensin I is cleaved by ACE (angiotensin-converting enzyme) and converted to Angiotensin II, which acts at the level of the cortex on the adrenal (gland promoting the release of aldosterone).

Aldosterone acts on the distal tube and increases sodium reabsorption, creating an osmotic gradient for water reabsorption, increasing plasma volume and blood pressure.

Angiotensin II has a direct action on the arterioles causing their constriction by indirectly activating the spinal bulb, increasing the activity of the sympathetic nervous system in the brainstem.

Angiotensin-converting enzyme inhibitors (ACE) are a class of medications that help lower your blood pressure and can protect your kidneys. They're used to treat cardiovascular conditions like hypertension, heart failure and diabetes-related kidney disease.

ACE inhibitors block angiotensin-converting enzyme (ACE) from converting angiotensin I into angiotensin II. Because angiotensin II raises blood pressure in multiple ways, reducing the amount in the body is an effective way to lower blood pressure.

Keywords: Renin, angiotensin, aldosterone system (RAAS), Angiotensin converting enzyme (ACE), AT1 receptors, Arterial hypertension e Cardiac insufficiency

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

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Adipose tissue is a specialized connective tissue formed predominantly by lipid-rich cells, adipocytes. This tissue`s can be subdivided in white and brown tissue and some of the main functions are storage of energy, protection of organs and contribution to the endocrine profile of the organism. The white adipose tissue has the function of storing energy in the form of lipids. White adipocytes are larger than brown ones, have fewer mitochondria and have a peripheral nucleus. Its function is to regulate hormones, such as insulin, while brown adipose tissue has the function of oxidizing lipids to produce heat.

Adipose tissue not only responds to afferent signals from traditional hormone systems and the central nervous system but also expresses factors with important endocrine functions like leptin, adiponectin, plasminogen activator inhibitor-1 and proteins of the renin-angiotensin system. Adipose tissue is also a major site for metabolism of sex steroids and glucocorticoids. Leptin is a hormone that the adipose tissue releases which helps our body maintain our normal weight on a long-term basis. Leptin's main function is to help regulate the long-term balance between our body's food intake and energy use.

Finally, the endocrine system is responsible for the production of hormones that help regulate the function of some organs such as: thyroid hormones that regulate temperature, energy expenditure and metabolism during decrease, can lead/aggravate obesity, also some sex hormones that influence the way fat is distributed throughout the body, being this a major factor in obesity.

Keywords: white and brown tissues, endocrine functions, Letpin

NON-ALCOHOLIC FATTY LIVER DISEASE, CHOLESTEROL METABOLISM AND STATINS

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Non-alcoholic fatty liver disease is an excessive fat build-up in the liver without another clear cause, such as alcohol use. There are two types: non-alcoholic fatty liver and non-alcoholic steatohepatitis. The stages of NAFLD are simple fatty liver, NASH, fibrosis and cirrhosis. In hepatic simple steatosis the buildup of highly toxic fatty acids associated with insulin resistance and the increased hepatic fatty acid synthesis from glucose acts as the "first hit" for NAFLD development and its progression seems to involve the occurrence of "parallel, multiple-hit" injuries. This is responsible for the triggering of signaling cascades leading to fibrosis and the hallmarks of NASH. Cholesterol is a fatty substance formed in the liver or obtained from food. It's transported by lipoproteins that can be low-density or high-density. LDL is the "bad cholesterol", because it carries from the liver to the cells and in excess builds up in the walls of the arteries, forming atherosclerotic plaques that obstruct the blood flow. HDL is the "good cholesterol" because it transports from the cells back to the liver, where it can be eliminated. Statins are medicines used to lower blood cholesterol levels and prevent the development of cardiovascular disease. They act primarily in the liver, where a special transport system allows their incorporation into liver tissue for biotransformation. Many patients report experiencing side effects, the most frequent are myalgias, arthralgia, weakness or nausea.

Keywords: Liver Disease, Cholesterol Metabolism, Statins

TEACH TO EMPOWER

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Introduction: The analysis of the data obtained from the food survey carried out with vulnerable users of the São José Community Centre, residents of Bairro da Rosa, revealed that 59.8% of these users consume more than one portion (50 to 100g) of red meat and processed foods (hamburger, sausage, ham) per day and that 61.5% of users do not practice physical activity.
Objective: To implement a nutritional policy in the São José Community Centre, in order to improve the quality of the dietary pattern and promote the practice of physical activity.
Methodology: We used documents and websites, such as the database with the answers to the survey conducted to the community under study, as well as the National Food and Physical Activity Survey 2015/16, INE, DGS and WHO.
Results: This nutrition policy will be implemented between September 2023 and September 2025 and is based on 3 axes of intervention using different strategies, which are promoting food literacy and empowerment, encouraging physical activity and improving the food supply. The establishment of partnerships will be essential for the realization of this policy.
Conclusion: It is expected that the implementation of this nutritional policy will lead to an improvement in the food quality of this community allied to an increase in physical activity.

Keywords: nutrition policy; physical activity; food literacy;

STRATEGIES TO INCREASE THE QUALITY OF LIFE ON THE POPULATION OF CENTRO SÃO JOSÉ

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Introduction: In the Community Center of São José there is a population with a difficult economic context, with low income, given the high unemployment rate. These factors influence food quality and diversification, since the low consumption of fruits and vegetables is one of the problems that stands out. Although they are a population with available time, due to their professional situation, and despite considering their health condition inadequate, they choose not to practice physical activity.
Objective: Building nutritional politics for the Community Center of São José.
Methodology: We used the questionnaire that was applied to the population covered by the São José Community Centre, and consulted the documents of the World Health Organisation.
Results: Our aim is to build a policy that will be implemented over 2 years, from September 2023 to September 2025. The policy is based on 3 intervention axes which foresee the development of several strategies, developing several partnerships with the community and local institutions.
Conclusion: After the study on the graphs and data provided through the questionnaire, the application and development of the policies and strategies applied, it is expected that there will be an increase in the consumption of fruit and vegetables and physical activity leading to a higher quality of life in the population covered.

Keywords: "Health promotion"; "Nutrition policy"; " Exercise promotion"

NUTRITIONAL POLICY: SAFER AND HEALTHY EATING

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Introduction: In Portugal, the principal modifiable risk factor that contributes to the mortality is the inappropriate food choices, being responsible for 14% of deaths and 9,5% of healthy life years lost. The questionnaire about healthy life habits of the vulnerable community followed by the Caritas Diocesana de Coimbra (CDC) reflects the bad food choices and unhealthy lifestyle choices that leads to low quality of life and well-being.
Objective: Construction of a nutritional policy for the community monitored by the CDC.
Methods: The development of the nutritional policy took place through the identification of the problems reflected in the questionnaires, in April. Additional support, like the IAN- AF 2015-2016 and PNPAS were used.
Results It was created a nutrition policy, with a duration of 2 years, starting september 2023, with three axes: community empowerment on healthy eating, involving educational food sessions and workshops; ensuring the safety and quality of food and improving the quality of services through a modification on the type of products offered leading to less waste and a better management of food, as well as trying to correspond the food preferences of the community; monitoring and nutritional consulting by assessments and accompaniment of the most vulnerable ones at a nutritional level. It will also be established partnerships with certain entities to develop the activities.
Conclusion: It is expected to achieve a better nutritional status and food literacy levels in the specific community, as well as the increase of the consumption of vegetables, fruits, and legumes at 25%.

Keywords: ‘’Health’’ ‘’ Food Safety’’ ‘’Food Choices’’

NUTRITIONAL POLITICS: LEARN WELL TO DO BETTER

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Introduction: Considering the people who took part in the questionnaire, low income and in a vulnerable situation, it was noticeable that many of their choices didn´t suggest that food was a priority. Sometimes unhealthy foods are consumed, but because of their prices, they´re the ones that the Portugueses can buy. In the sample studied, 61,5% of the subjects said that sometimes they don't have enough money to buy food and 18,3% said that sometimes or almost always they don´t have enough food to eat. Considering fruit consumption, were found that 51,9% of individuals consume less than 3 pieces of fruit daily.
Objective: Build a nutritional policy for the users of the institution Centro Comunitário de São José, to improve food supply, especially the consumption of fruits.
Methodology: Was used the Questionário Quiosque da Saúde complemented by Documents such as IAN-AF 2015-2016, COSI 2019, DGS, PNPAS 2022-2030.
Results: This nutritional policy will be centred on 3 axes of intervention, made up of multiple strategies that will allow to achieve the established goals. These 3 axes focus on improving the variety and quality of food choices and, promoting healthy, balanced, and low-cost meals; increasing fruit consumption, reaching the recommendations proposed by the WHO; promoting healthy lifestyles, by the practice of physical activity. The nutrition policy will be developed between May 2023 and May 2025.
Conclusion: It´s hoped that the implementation of this nutritional policy will result in an improvement in the quality of food choices of the entire population attending the CCSJ.

Keywords: "fruit comsumption", "healthy lifestyles", "economy"

EMPOWERING PATIENTS OF THE CENTRO SOCIAL DE SÃO JOSÉ TO CHANGE THEIR DIET

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Introduction: The patients who attend the Centro Social de São José are mostly a low income population, unable to comply with a healthy and balanced diet. Considering the analysed data, 64% of the patients chose to buy unbalanced, cheaper and less varied food for themselves and their children, and 15.6% refer to not being able to feed them properly.
Aim: Build a nutritional policy to improve the alimentation of the patients and their household.
Methodologies: An analysis was performed, using SPSS, of the questionnaires applied to the population attending the Centro Social de São José. In addition, we supported our research through the National Dietary and Physical Activity Survey 2015-2016 (IAN-AF 2015-2016).
Results: This policy is based on 3 axes, which are empowering, improving the food supply and combating food waste, for which various strategies will be developed. There will also be partnerships at the community level. The implementation of this policy will last for one year.
Conclusion: With this policy, we hope to empower patients to make healthier choices at a lower cost, make a better use of food and a more balanced diet for them and their children.

Keywords: Keywords: “food offer”; “healthy food”; “low income”; “household income”

PROTEIN CONSUMPTION: PROPOSAL FOR A NUTRITIONAL POLICY

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Introduction: The questionnaire about healthy life habits of the vulnerable community followed by the “Caritas Diocesana de Coimbra” (CDC) reflets the unhealthy lifestyle of the population. The main protein source of the Portuguese population is meat and its consumption is above the reference values, and the same applies to dairy products. However, there are other sources of protein within the food wheel. Legumes intake it’s quite inferior when compared with other foods. To improve food sustainability, changes in the main protein source are needed to have a more ecological diet.

Objectives: To develop a nutritional policy that improves the population's food choices, with regard to the choice of protein sources.

Methodology: A survey was carried out through questionnaires about healthy life habits of the vulnerable community of the “Centro Social de São José” to analyze the main weaknesses of the population. Regarding policy development, we analyzed IAN-AF 2015-2016 and programs already implemented.

Results: This policy had a duration of 1 year, starting september 2023. It also had three axes: Developing health literacy, promoting a more sustainable diet (by raising awareness of high meat consumption) and increasing legume consumption. The activities chosen for this intervention include educational lectures, workshops on more sustainable recipes and didactic activities for the community.

Conclusion: We expect the consumption of legumes to increase and, consequently, the excessive consumption of meat and dairy products to decrease, in order to achieve a more diverse and sustainable diet.

Keywords: “Protein”, “Protein Consumption”, “Health Policy"

LOCAL NUTRITIONAL POLICY TO INCREASE ACCESS TO A HEALTH PROMOTING DIET

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Introduction: Inadequate diets are one of the main causes of preventable chronic diseases. Notwithstanding nutrients importance, food as a source of pleasure and cultural/family identity is also a much-needed approach in health promotion. Despite the apparent availability of food in urban centres, impoverished families remain with little access to healthy foods, particularly during economic crises. A study developed in Bairro da Rosa, Coimbra – a public housing neighbourhood – revealed inadequate diets in most respondents, where price was considered the main barrier to the consumption of healthy foods. Furthermore, most respondents reported an unintentional weight loss in previous months.

Objective: Develop a local nutritional policy, within the Well-Being Kiosk initiative, that increases the access to health promoting diet.

Methodology: Diagnosis was based on statistical analysis, using SPSS, of the Well-Being Kiosk questionnaire. Relevant stakeholders were identified. The policy complies with OMS guidelines and was developed based on other successful local policies already implemented.

Results: The policy was designed to have a minimum duration of three years (2024-2026) and was based on four axes: Inform and Empower; Care and Support; Develop; Monitor and Evaluate. Several initiatives will be developed within each axis, which will require the establishment of partnerships with various local institutions/organisations, such as the municipality, supermarkets, farmers, the Polytechnic Institute of Coimbra, Cáritas, among others. The implementation will occur mainly within the community.

Conclusion: With this policy, it is expected an improvement in diets, an increase in access to healthy foods and a reduction of the prevalence of unintentional weight loss in member of this community.

Keywords: Nutritional policy, food access, health promotion, Well-Being Kiosk, Coimbra

FRUIT FOR ALL

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Introduction: From the analysis of a survey conducted with users of the São José Community Center, it was possible to ascertain that most people with economic difficulties have a fruit consumption of less than 3 pieces per day, taking into account that the recommended by the Mediterranean Food Wheel are 3 to 5 servings daily, and each portion corresponds to an average piece of fruit of 160g.
Objective: To build a nutritional policy at the São José Community Center.
Methodology: The basis used for the construction of the policy was a survey conducted with the users of the São José Community Center and as auxiliaries were used several documents such as the Spoon Knowledge of the APN, PNPAS, DGS, WHO and ACFMNP.
Results: They were a program that will extend from June 2023 to June 2028, and which aims to promote nutritional literacy, awareness and training, as well as the fight against food waste.
Conclusion: With the implementation of this policy it is intended that the most needy people of the São José Community Center have easier access to the fruit.

Keywords: Fruit, Consumption, Nutrition

DEVELOPMENT OF A NUTRITIONAL POLICY IN THE S. JOSÉ SOCIAL CENTER, COIMBRA

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Introduction: Nowadays, maintaining a healthy lifestyle can be a challenge, both economically and due to a lack of health literacy. Increasing the consumption of fruit and vegetables on a daily basis, as well as reducing sedentary lifestyles is imperative for a better quality of life and health. In the population under study, especially made up of poor families, 59.6% consume less than 5 portions of fruit and vegetables daily, 53.8% do not practice physical activity daily and 89.4% have a BMI above the normal value.

Objective: Development of a nutritional policy for the S.José Social Center located *in* Bairro da Rosa, Coimbra.

Methods: The database relating to the questionnaire applied to families in the social neighborhood in question was analyzed, together with programs for the development of the nutritional policy, such as the IAN-AF 2015-2016, EIPAS and PNPAS.

Results: This nutritional policy is centered on 3 axes of intervention, which use a set of strategies in order to educate and raise awareness among families with greater economic difficulty. These axes consist of improving eating habits, promoting the practice of physical activity, and also raising awareness about maintaining a healthy weight. The nutritional policy will be developed between June 2023 and June 2025 and will rely on the partnership with local grocery stores, Auchan Coimbra, Coimbra City Hall and Go Gym Coimbra.

Conclusion: It is intended that the implementation of this nutritional policy will result in the improvement of the health of families in this region.

Keywords: “Nutrition policy"; "Coimbra"; "Physical activity"; "Fruit and vegetables", "BMI".

USERS' PERCEPTION OF WATER QUALITY, STRUCTURAL AND OPERATIONAL CONDITIONS OF WATER PARKS

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A water park is defined as a natural/artificial water surface used for recreational/sports use. Hygiene and sanitary conditions must be taken into account, with appropriate supervision, for these spaces to be used by the population.

We established as the main objective of the work the perception of the users of swimming pools about water quality, structural conditions and functioning of the water parks.

In order to carry out this work, a literature review was done on the subject and a questionnaire was applied to the general population.

According to the results, most of the respondents (97,1%) consider important the daily treatment of the water in the pools, because the lack of hygienic water treatment can cause several diseases. They also consider that the three most harmful consequences to health due to inadequate water treatment are skin irritations (88.6%), allergies (85.7%), and mycoses (82.9%). Regarding the good practices to have in these places, it was found that, in general, individuals have correct attitudes for a good operation of the water parks. 68.6% are concerned with the hygiene conditions of the facilities, 66% are concerned with the safety conditions of the equipment, and 82% are concerned with having adequate care in the locker rooms.

It was concluded that people are aware of the issue, causes, and associated dangers, and have already taken some precautionary measures for diseases caused by ineffective water treatment and poor sanitation of the space. However, it is still necessary to take other measures that are also important, taking greater care regarding this issue.

Keywords: hygiene and sanitary conditions; water quality; consequences; good practices

LEVEL OF KNOWLEDGE AND GOOD PRACTICES IN THE USE OF RIVER BEACHES

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The use of river beaches has grown over the last few years, the alternative to beaches and the usual swimming pools has been an option on the part of people, and with that it is necessary that they have a good level of knowledge for the good use of them, knowing the possible risks to which they are exposed and preventing themselves from these.

The objective of this work was to develop the theme, and thereby assess whether the population has a good level of knowledge and good practices regarding the use of river beaches.

In this article, a literature review was carried out regarding the use of river beaches, and a questionnaire was applied to assess the population's levels of knowledge and good practices.

Through the survey, we can conclude that in general the population is aware of the main dangers, with 92% of respondents correctly answering the question “Level of knowledge of the population regarding the dangers on river beaches”, which is the first step to avoid them. With regard to risk prevention, the results were positive as 94% of the population revealed that they took the main precautions when using river beaches. As for the frequency with which these precautions are taken, the results were not so positive as only 21% of the population always practices these preventive measures.

It was therefore concluded that the majority of the population surveyed knows and has good practices for using river beaches, however it is necessary and pertinent to continue to make themselves known through awareness campaigns, lectures, etc... thus educating people.

Keywords: River Beaches, Risks; Prevention, Dangers; Knowledge

LEVEL OF KNOWLEDGE ON THE IMPLICATIONS OF CYANOBACTERIA ON HEALTH AND THE ENVIRONMENT

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Cyanobacteria are organisms have their benefits for the environment and public health. However, when subjected to environments with characteristics as high temperatures, high intensity of light, and large nutrient loads, cyanobacteria can develop in high densities, giving rise to blooms of this species. These can affect human health due to their ability to produce toxins.

This work aims to evaluate the population's level of knowledge about the implications of cyanobacteria on human health and different ecosystems. It's also helpful to identify possible health risks, as well as consequences.

From the results we got from our research, where 52 responses were obtained, it was concluded that a large part of the population understands what cyanobacteria are (71.2%) and that their presence is harmful to our health (76.9%). It should be noted that most of the individuals are able to identify that the presence of toxins in water is a consequence for humans as well as the environment.

It is necessary to raise awareness among the population about the presence of cyanobacteria in water through the implementation of politics and training actions, emphasizing the education of younger generations so that they can acquire more sustainable perspectives and habits towards a better future for our planet and also future generation.

Keywords: Cyanobacteria's; Public health; Water; Ecosystem; Population

LEVEL OF KNOWLEDGE AND BEST PRACTICES IN THE USE OF MARITIME BEACHES

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The sea beaches are inserted in environments with great diversity of fauna and flora and very specific landscapes.
Some good practices to have when we frequent beaches are, do not take dogs and other animals to an unauthorized beach, do not throw waste on the sand or in the sea, bathe in the areas indicated as bathing zones, if you see any unusual object in the water warn the lifeguard, if after attending the beaches have any allergies, Notify the competent authorities immediately, as it may be derived from some bacteria in the water.
From the questionnaire, we obtained 29 answers obtaining the following results: 58.6% are always concerned with the water quality of the beaches they frequent; 55.2% have felt that they have frequented a beach with poor water quality; 96.6% say they have not suffered a disease associated with the use of beaches. Regarding the quality of the equipment, 58.6%, says that it is reasonable and about the good practices adopted, regarding the taking of shower before and after going to the beach 27.6% says almost without pre or sometimes, put the waste in the correct place 79.3% says always or almost always, and as for the attention of the water temperature 31% says almost always and 20.7% says rarely.
The general population is informed about the good practices to be adopted in the maritime beaches and also about the conditions of hygiene, safety and water quality.

Keywords: Sea beaches; water quality; good practices

Discipline: Water Quality Management II

Professor: Cristina Santos

Degree: Environmental Health

A 113

Edition 19/2023

SOCIAL AND ENVIRONMENTAL IMPACTS OF WASTE WATER TREATMENT PLANTS

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The pollution of rivers, the constant loss of quality of life and the evidence of risk to public health led to the construction of the first Wastewater Treatment Plants (WWTP). These infrastructures aim to reduce the pollutant load of wastewater, so that when released into waterways it does not adversely affect the receiving environment.

The main objective of this article was to demonstrate the environmental and social impacts of WWTP in order to better understand the current situation.

The conception of this work went through the analysis of several scientific articles related to the theme under study, also making use of a questionnaire directed to the general population.

Through the research done on this topic and in view of the results obtained in the questionnaire released, we can conclude that most of the population surveyed understands what a WWTP is (97.8%), as well as its main negative social impacts, such as bad smell (67.4%), and positive environmental impacts, the improvement of basic sanitation conditions (63%). However, we found a lack of information on the positive, social and negative environmental impacts.

We conclude that through this work it was possible to recognize the main positive and negative points of a WWTP, whether environmental or social. If there are clear failures of awareness on the part of the population, it is essential that there is a multidisciplinary work and the competent entities should act in favor of the awareness of the population that still strongly opposes the construction of WWTP.

Keywords: Social impact; environmental impact; waste water; Public health

LEVEL OF KNOWLEDGE AND GOOD PRACTICES IN THE USE OF INDOOR POOLS

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Learning and practicing swimming promotes society's health at a physical, psychological and cardiovascular level. In swimming pools, as in any other environment, there are risks that can endanger the health of its users (physical, biological, and/or chemical), and to it is necessary to put up to them or reduce them. For this, we must put some good practices at use within the site. With this study we intend to find out statistics about the population's knowledge about these practices in indoor swimming pools.

With the questionnaire applied, we were able to verify that 79,2% of the population of the study, claims to know the good practices to adopt in indoor pools, and only 66% ends up adopting them very often. The most frequently adopted measures were, in decreasing order: the use of shower cap and swimming shorts in good hygienic conditions, and getting out of the pool when you want to use the bathroom.

At last, in this study, we realize that it is essential that both the users of indoors swimming pools and the managing entities and their workers take action. Nevertheless, although the population in question seems well informed about the subject, it is still important to raise awareness of good practices they can follow, in order to increase sanitary hygiene and decrease the risk of injuries and infections.

Keywords: Swimming pools; knowledge; Good practices

LEVEL OF KNOWLEDGE AND GOOD PRACTICES REGARDING *LEGIONELLA*

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Legionella is a bacteria that can cause serious respiratory illnesses such as Legionnaires' Disease and is transmitted mainly through air conditioning systems and contaminated water. The infection occurs through the inhalation of droplets of contaminated water, which lodge in the lung alveoli. In Portugal, there have been several outbreaks of Legionella in recent years, the most serious occurred in 2014, *in* Vila Franca de Xira.

This work aimed to evaluate the level of knowledge and good practices regarding Legionella in the Portuguese population using as a methodology the bibliographic review on the subject and the application of a questionnaire.

By analyzing the results, it was found that all respondents are familiar with the concept of *Legionella*. It was found that 95.1% of respondents recognize that Legionella is a bacterium, 79.4% know that it is transmitted through the airways and 74.5% identify atypical pneumonia as the main disease caused by the bacterium. In addition, 69.6% admit that the main form of transmission is through the air and 87.3% of respondents consider that keeping stagnant water infrastructure clean and disinfected is the most important preventive measure to avoid the proliferation of *Legionella*.

In short, it is necessary to continue raising public awareness of the importance of preventing Legionella and the adoption of good hygiene and maintenance practices. To this end, it is important that there is greater publicity about the disease and its prevention, in order to protect public health.

Keywords: Bacteria; Legionnaires' Disease; Prevention; Good habits

SYSTEMIC SCLEROSIS

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Systemic Sclerosis or Scleroderma is a chronic inflammatory systemic disease, which is characterized by inflammation and fibrosis of tissues and changes in blood vessels, affecting various organs, especially the skin, digestive tract, lungs, kidneys and heart. The main cause of this disease is autoimmune disorders. It can be characterized as systemic sclerosis, which affects multiple organs and a more localized one that just affects the skin. The prevalence of this disease among adults is approximately 1 in 6500. Females are more likely to be affected.

Genetic variations in several genes, including those in the human leukocyte antigen complex, influence the likelihood of developing this condition. Although systemic sclerosis often occurs randomly, the chances of developing this illness may increase for individuals who have relatives with autoimmune disorders. Additionally, certain genes related to immune function are considered risk factors for the development of systemic sclerosis.

The diagnosis of Systemic Sclerosis is usually based on the presence of certain symptoms and physical examination findings, such as the appearance of marked pallor in certain areas of the body, usually the extremities and face, swelling of the fingers, intermittent coldness, dysphagia, skin thickening, joint immobility and abnormal nailfold capillary findings. Confirming the diagnosis may involve detecting certain autoantibodies in the blood.

While there is no cure for systemic sclerosis, there are a variety of treatments available to manage the symptoms and slow the disease progression. The more commonly used treatments are: medication, physical therapy, occupational therapy, pulmonary rehabilitation and surgery.

Keywords: Systemic Sclerosis, Inflammation, Autoimmune Disorders

SYSTEMIC LUPUS ERYTHEMATOSUS

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Systemic Lupus Erythematosus (SLE) is a chronic inflammatory, multisystemic, autoimmune disease of unknown etiology. Even so, it is known that genetic, hormonal and environmental factors are related to its development. SLE occurs mostly in women between puberty and menopause. However, although less common in men, it tends to be more severe.

Symptoms can appear in different organs slowly and progressively or quickly, varying with phases of activity and remission that can last for years. Exacerbations can be increased by sun exposure, infection, surgery or pregnancy. It mainly affects the skin, lungs, heart, joints and central nervous system.

The diagnosis of SLE can be difficult since it presents several non-specific clinical manifestations such as fever, weakness, loss of appetite, headache, organ and joint malfuction. A positive antinuclear antibodies (ANA) test is seen in more than 97 percent of cases of SLE, it must be the first teste performed. However, it does not confirm the diagnosis since it can also be positive for other autoimmune diseases.

SLE treatment depends on the organs affected and the level of inflammation activity. Its aim is to decrease inflammation, which in turn should prevent further injuries.

Keywords: SLE, chronic, autoimmune, remission, ANA, inflammation

FERROPTOSIS

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Ferroptosis is a new form of cellular death that results from iron accumulation, mitochondrial activity, amino acid metabolism, lipid peroxidation and oxidative stress in cells caused by the depletion of the antioxidant enzymes.

Its first discovery was made in 2012 when doing a screening to test drugs for cancer treatment.

Ferroptosis leads to numerous organ injuries, such as digestive tube organs, nervous system, cardiovascular and respiratory system. This phenomenon changes the mitochondrial morphology and its cristae structure, which is a different process from other modes of cell death.

These changes are crucial to differentiate ferroptosis from other kinds of cellular death such as apoptosis and necrosis. Unlike necrosis, ferroptosis doesn't cause the rupture of the cell membrane or either the release of its organelles. It is also not similar with apoptosis, which creates apoptotic bodies and vesicules containing cellular organelles. An alternative for monitoring in vitro ferroptosis is detecting serum levels of iron and GSH.

Ferroptosis is induced by the excessive circulating iron that leads to the making of ROS. Being a form of programmed cellular death, the ferroptosis mechanism can be used for treatment in drug-resistant cancer patients as mesenchymal state patients and prone to metastasis, working as a tumour suppressor.

It has a role in some pathological processes such as neurodegenerative diseases and ischemia.

A better understanding of ferroptosis is crucial to improve diagnosis quality and create new therapeutic interventions.

Keywords: Ferroptosis, cellular death, organ injuries, ROS.

Discipline: Systematic Pathologic Anatomy

Professor: Diana Martins

Degree: Biomedical Laboratory Science

A 119

Edition 19/2023

STEM CELLS: IMPORTANCE AND THERAPEUTIC APPLICATINS

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Stem cells are found in various tissues and organs. Since they are unspecialized, they are able to originate any cell in our organism and are therefore used in various therapies that are a part of transplant procedures.

There are two types of stem cells: The embryonic stem cells which are the most effective, these are found in the umbilical cord and in the early stages of pregnancy, and are usually used in "in vitro fertilization". The adult stem cells, although less effective, are equally important and are the ones that accompany the individual throughout their lives.

Therapy using stem cells is a form of regenerative medicine created to repair damaged cells in the body, by modulating the immune system and reducing inflammation. This makes this type of therapy a viable treatment option for various diseases.

The various therapeutics cover areas such as cancer, cardiovascular and nervous systems, they are also used in transplantation, in vitro applications, drug discovery and testing, tissue regeneration and repair, gene therapy, immunotherapy and personalized medicine.

Nowadays, a good example of the use of these cells is the hematopoietic stem cells like CAR-T and Mesenchymal stem cells (MSCs), which are found in the bone marrow. They are a type of adult stem cells used for the treatment of cancer cases (such as leukemia) and blood diseases.

In the future, these cells may also help treat incurable neurodegenerative diseases, fertility disorders, and even be used in cloning, which is fraught with many ethical problems.

Keywords: Stem cells, Therapy, Unspecialized, Cancer, Transplantation, Disease

IMMUNOTHERAPY IN THE TREATMENT OF CANCER

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Cancer immunotherapy uses the specificity of the patient's immune system to treat malignant diseases. In fact, the purpose of immunotherapy is to provide the immune system with the ability to fight tumor cells in a way that doesn't harm normal cells. Chimeric Antigen Receptor T (CAR-T) cells, vaccines, monoclonal antibodies and checkpoint inhibitors have been revolutionizing cancer therapy.

CAR-T cells are the result of a genetic modification of the patient's own T-cells, which involves the addition of a specific antigen receptor that gives them the ability to locate and eliminate tumor cells carrying those antigens. Subsequently, the modified cells are infused back into the patient.

Vaccines to fight the tumor are derived from isolated proteins or whole cells extracted from the patient, which are removed and injected to the patient with the aim of guiding other cells to produce an immune response. Consequently, vaccines recognize the tumor cells as abnormal and fight them.

Monoclonal antibodies are proteins modified in order to be specific for a particular type of antigen expressed by tumor cells, binding and triggering an attack response.

T cells express checkpoints on the membrane that prevent the body from setting up an immune response against normal cells. However, tumor cells can begin to express these checkpoints, preventing them from being recognized by the immune system. Thus, a therapy was created to inhibit these checkpoints.

Therefore, immunotherapy is a true ally in cancer treatment, as it has contributed to the increase of life quality and survival of oncologic patients.

Keywords: Immunotherapy, Chimeric Antigen Receptor T, Vaccines, Monoclonal antibodies, Checkpoint inhibitors

THE IMPORTANCE OF MICROBIOME IN HEALTH AND DISEASE

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The microbiome consists of a community of microorganisms that colonise the human body. Relations within this community are complex and their harmony is essential for the preservation of an individual's health. The microbiome is specific to each part of the body and includes viruses, fungi, bacteria and protozoa, which may exhibit commensal or pathogenic behaviour.

The "Human Microbiome Project", allowed the analysis of specific microbial communities and their metabolism, being this knowledge applied to public health. The microbiome begins to develop during pregnancy and is influenced by the type of birth and breastfeeding. It is different for each person, as external factors such as lifestyle, genetics, and even the ageing process can interfere.

The human microbiome is essential for human survival as it plays an important role in protecting from harmful microorganisms, improving the immune system in distinguishing between beneficial and harmful substances, functioning as a physical barrier and destroying toxic compounds. Regarding nutrition, it also helps regulate appetite and satiety, store energy from ingested food, aid in the absorption of minerals, synthesise essential vitamins, and can even influence our humour and behaviour.

A healthy microbiome is crucial because it may both help treat and prevent several diseases. Contrary to this, unbalances in the microbiome might lead to the emergence of a variety of illnesses such as obesity, malnutrition, asthma, diabetes, hepatic disease, and cancer, among many others.

Keywords: Microbiome; Diseases; Health

ALZHEIMER'S DISEASE

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Alois Alzheimer, in 1907, described the case of a woman that had progressive loss of memory as well as psychiatric disturbances. Alzheimer's disease is a neurological condition that affects brain cells and declines cognitive skills. Some of the most common risk factors are age, head injuries, vascular diseases, infections, genetic and environmental factors. The disease has three different stages: the early stage or mild which is when a person still functions independently, but may have memory lapses, the moderate/middle stage is when the dementia symptoms are more pronounced, and the late/severe stage is when the person is unable to communicate. Alzheimer's causes many anomalies in the brain tissue development such as: an accumulation of beta-amyloid protein and the tau protein, which is essential for communication between neurons, stops working correctly. Levels of acetylcholine, whose function is to help memory and concentration, are also low. There are now two classes of approved drugs to treat AD, them being inhibitors to cholinesterase enzyme and antagonists to N-methyl d-aspartate (NMDA), thought these treatments don't cure the disease they only help reduce the symptoms. Nowadays, studies are focusing in understanding mechanisms on AD, like the abnormal tau protein metabolism, cholinergic and free radical damage, inflammatory response, in order to develop treatments that are capable of modifying Alzheimer's disease course.

Keywords: Alzheimer, tau protein; β-amyloid peptide; therapy

GRAVES' DISEASE: A COMPREHENSIVE OVERVIEW

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Graves' disease is a common autoimmune disorder affecting the thyroid gland and other organs like the eyes and skin. It has a higher incidence in women aged between 20 to 50 years and is often associated with a positive family history. The disease accounts for 60% to 80% of hyperthyroidism cases, making it the leading cause of this condition.

The diagnosis of Graves' disease begins with a comprehensive physical examination and a thorough medical history. If necessary, hyperthyroidism differentiation tests such as the measurement of TSH receptor antibodies, a radioactive iodine intake scan, thyroid ultrasonography with Doppler, or T3/T4 ratio evaluation can confirm the clinical impression. Healthcare providers can typically identify features suggestive of Graves' disease during the initial physical examination and clinical history evaluation, such as a positive family history, orbitopathy, diffusely enlarged thyroid with or without a bruit, and pretibial myxedema. Moreover, thyroid function tests are the most common method for diagnosing Graves' disease, as they typically show a recognizable pattern consistent with the assessment of thyroid status. Treatment options, including antithyroid medications, radioactive iodine, or surgery, depend on the severity and clinical presentation of the patient.

In conclusion, Graves' disease is a relatively common autoimmune disease that affects various organs, with the thyroid gland being the most affected. A clear diagnosis can usually be made through a thorough history and physical examination, and healthcare providers must consider Graves' disease as a possible cause of hyperthyroidism and provide appropriate management and follow-up.

Keywords: Hyperthyroidism, Graves’ disease, diagnosis.

FOODS MADE USING MICROORGANISMS

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In recent years, the role of a healthy diet in maintaining or improving health has increasingly sparked the interest of the scientific community and also the consumers. This has led to more studies being conducted with the aim of proving the action of bioactive components in reducing the risks of certain diseases. Thus, there has been a huge advance in the development of probiotic and prebiotic products. Probiotics are live microorganisms that when consumed bring benefits to the consumer's health, while prebiotics serve as food for probiotic microorganisms and are only metabolized or absorbed when they reach the intestine. These microorganisms are responsible for producing some foods, such as kefir, skyr, cheese, bread, wine, or beer. The microorganisms that produce these products are *Lactobacillus acidophilus, Streptococcus thermophilus*, and *Lactobacillus delbruekii* in the case of kefir, *Streptococcus thermophilus* and *Lactobacillus delbruekii* subsp. *bulgaricus* in skyr, and *Saccharomyces cerevisiae* in bread, wine, and beer. Some of these foods are produced by fermentation, such as bread, beer, or wine, while others are produced by molds, such as some cheeses. Among these, kefir has great health benefits such as anti-inflammatory, antioxidant, and anticancer effects, while skyr has a high protein content and almost no fat, and also improves intestinal microflora and transit.
The aim of this work is to present the microorganisms involved in the production of some fermented foods and the health benefits of these fermented foods.

Keywords: Microorganisms; Skyr; Wine; Bread; Beer

MICROBIOLOGICAL COMPOSITION OF KOMBUCHA TEA AND ITS BENEFITS

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Kombucha is a fermented beverage that first emerged in northeaster China and is now consumed around the world. Known to be a sweet and sour drink, traditionally produced by fermenting black, green or oolong tea with the addition of sugar and a symbiotic culture of bacteria and yeast (SCOBY). SCOBY is made up of acetic acid bacteria for exemple, Acetobacter xylium, lactic acid bacteria like, *Lactobacillus* and yeast like, *Zygosaccharomyces bailii*. However the constitution of SCOBY can vary.

Yeast anaerobically metabolizes sucrose to produce simple sugars, fructose and glucose, and alcohol, which later, as bacteria, aerobically, will metabolize into organic acids and carbon. Organic acids, such as acetic acid and glucuronic acid, together with polyphenols provide numerous gastrointestinal, hepatic and immune benefits, and have anti-inflammatory function.

Due to the composition of SCOBY and the bioactive constituents of this beverage, kombucha has a wide range of health benefits associated with its fermentation process and has even been suggested as a potential source of probiotics. Fermentation induces structural breakdown of plant cell walls, leading to the release or synthesis of several antioxidant compounds, including polyphenols. These compounds have the primary function of eliminating free radicals, which lead to the formation of oxidative stress and damage to structures in the human body.

However, further studies should be carried out in order to allow better conclusions regarding the influence of the activity of microorganisms on bioactive compounds and vice versa.

Objective: Understand the microbiological constitution of Kombucha and what are the health benefits of consuming this drink.

Keywords: Kombucha; SCOBY; fermented beverage; antimicrobial activity; antioxidant

CABBAGE TO SAUERKRAUT: CARACTERIZATION OF MICROORGANISM ECOSYSTEM AND HEALTH BENEFITS

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Sauerkraut is a cabbage product resulting from lactic acid fermentation. These are important for their contribution to sensory characteristics and preservative effects. It is known to have a high nutritional value, including an abundance of probiotics, having beneficial effects on the human organism.

The sauerkraut's fermentation process may show differences in microbial diversity, explained by the fermentation conditions. There are two phage-host systems in the fermentation from heterofermentative to homofermentative LAB populations. *Leuconostoc mesenteroides* and related LAB, including *Weissella*, are importante in the initiation of the fermentation. Under normal conditions, the fermentation is essentially complete within 2 weeks, with the most-acid-tolerant species, *Lactobacillus plantarum*, predominating. As sugars diffuse from the vegetables into the brine, the LAB grow rapidly. This promotes innate and adaptive immunity and attenuate inflammation by modulating the intestinal microbiota. In other hand the formation of lactic acid, has potential for influencing the rate of pH decrease. Likewise, the high potassium content of sauerkraut is believed to combat the hypertensive effects of added salt. These conditions does not only extend the product's shelf life, but also provides various health benefits, such as improving nutritional quality, food safety, anti-inflammatory, antioxidant and anti-cancer activities. Sauerkraut has a great potential with content of bioactive compounds, and this dynamic biochemical system that are in constantly changing promising beneficial impacts in terms of health.

The purpose of this literature review is to characterize the microorganisms present in a sauerkraut fermentation and what are the health benefits.

Keywords: Sauerkraut; Microorganism; Benefits; Fermentation

MICROORGANISMS AS BIOCONSERVANTS IN THE FOOD INDUSTRY

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Food preservation is a constant challenge for the food industry, which seeks to increase the shelf life of products and avoid contamination by pathogenic microorganisms. The use of synthetic preservatives is common, but it can pose risks to health and the environment. In this context, bioconservants, produced by microorganisms, have been considered a healthier and more sustainable alternative.

Microorganisms used as bioconservants include lactic acid bacteria, filamentous fungi, bacteriophages, and enzymes. These produce compounds that act in the fight against microorganisms present in food.

They have been successfully used in the conservation of different types of food and the benefits of using bioconservants include increased food safety, reduced use of synthetic preservatives and renewable and biodegradable sources.

Despite the benefits of using bioconservants, there are still challenges associated with their responsible use, such as ensuring the safety and quality of products, as well as conducting toxicity and stability studies of the compounds used. In addition, it is important to remember that the use of bioconservants is not a single solution for food preservation, and other control measures should be implemented to ensure food safety.

Therefore, microorganisms used as bioconservants represent a healthier and more sustainable alternative to synthetic preservatives in the food industry. The use of these should be seen as part of an integrated approach to quality control and food safety in the industry.

The objective of this work was to present an overview of the microorganisms used as bioconservators in the food industry, including the different types, mechanisms of action, effectiveness, benefits and challenges associated with their responsible use.

Keywords: Microorganisms, bioconservants, food industry

KEFIR- PRODUCTION AND NUTRITIONAL BENEFITS

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Kefir is a fermented beverage made from kefir grains and has its origins in the Caucasian mountains. It is mainly consumed in Occidental Europe, Russia and Southwest of Asia. Giving its numerous nutritional benefits, kefir has been recommended for the treatment of several clinical conditions. The grains are immersed in milk where they carry out a double fermentation and develop a characteristic acidic and slightly sour taste.

Kefir grains are cultures of several species of microorganisms living together in a symbiotic community, consisting of acetic acid bacteria, yeasts, and lactic acid bacteria, the most predominant belong to the genera *Lactobacillus*, *Lactococcus*, *Leuconostoc* and *Streptococcus*.

Currently there are mainly two methods of making kefir: traditional and industrial process.

Traditionally, kefir is produced from cow's milk, however, it is also made from the milk of sheep, goats and buffalo. Recently, kefir has also been made from soy milk .

Certain products resulting from the industrial application of kefir are: yogurts, bread and biodegradable edible films.

The benefits are: low production cost, antimicrobial activity, probiotic action, immune system stimulation and antidiabetic function.

Since Kefir is a potential source of probiotics and has highly interesting healthy properties, it's a great option to include in our diet. Kefir's applications in the food industry are expanding and, therefore, the understanding of the symbiotic relationships between the different microorganisms and food, as well as optimal conditions for fermentation, can help in the improvement of technological food processes.

The aim of the present work is to study kefir's composition, production and its health benefits.

Keywords: kefir production, kefir and microbiota, kefir benefits

THE COMPLEX MICROBIAL COMMUNITY BEHIND TEMPEH PRODUCTION: AN ANALYSIS OF DIVERSITY AND INTERACTIONS BETWEEN MICROORGANISMS

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Tempeh is a traditional Indonesian food produced by fermenting cooked and dehulled soybeans with a starter culture of the fungal species Rhizopus oligoporus at room temperature. There are many variables in the fermentation process, including microorganisms, nutritional ingredients, and environmental conditions, giving rise to thousands of different variations of fermented foods, like Tempeh. Its production involves two distinct fermentations, one is microbial and the other is fungal. Fermentation under aerobic conditions allows rapid growth of the mycelium, but without sporulation. In anaerobic conditions or with low O_2, the mycelium growth is reduced or even null. Its microbial composition can vary according to some ecological factors, such as: acidification by lactic acid bacteria during the immersion phase, the lethal effect of cooking, contamination during the handling of the cooled food, heat and mass transfer during fungal fermentation, and incubation and storage conditions of the product. Tempeh is a food with very beneficial characteristics when it comes to patients who have some problems at the intestinal level. According to studies, tempeh-based foods are readily available sources of nutrients for individuals suffering from malnutrition and/or acute diarrhea, where the need for easily digestible rehabilitative foods is high. Despite the limitations of some studies, this product is also said to have other beneficial health effects, such as "anticarcinogenic", "antidiabetic", "antioxidant", "anti-inflammatory", and "antihyperlipidemic" effects.

Objective: To analyse the diversity and interaction of the microorganisms present in tempeh and understand the beneficial effects that this food has.

Keywords: “Tempeh”, “Fermented food”, “Microbiota”

BREWER'S YEAST IN MICROBIOLOGY AND HEALTH

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Brewer's yeast, also known as *Saccharomyces cerevisiae*, is a single-celled microorganism belonging to the Saccharomycetaceae family. It is commonly used in beer production, but can also be found in food supplement form. Its cell wall is composed mainly of β-glucans, mannoproteins and chitin, which help maintain the structural integrity of the cell and protect it against environmental stress. These β-glucans are glucose polymers with different types of glycosidic bonds and anomeric configurations.

Although it is a eukaryotic cell, it has a much simpler structure, which makes this yeast an excellent tool for studies in cell and molecular biology.

The aim of this work is to present the Brewer's yeast involved in the production of food due to its nutritional and medicinal properties.

The use of brewer's yeast has been studied in microbiology and health due to its nutritional and medicinal properties (rich in proteins, B vitamins, minerals) besides containing β-glucans, which have been associated with prebiotic effects, antioxidant and blood lipid regulation, glycaemic control of diabetes and cholesterol reduction and improvement of the immune function. Studies have shown that brewer's yeast may have beneficial effects in the prevention and treatment of diseases such as diabetes, heart disease, cancer and irritable bowel syndrome.

However, it is important to note that excessive consumption of brewer's yeast can lead to side effects, such as gastrointestinal disorders. In this sense, further studies are needed to fully understand the effects of brewer's yeast on human health and establish safe consumption recommendations.

Keywords: brewer's yeast, tempeh production