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REVISTA DE CIÊNCIAS DA SAÚDE
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E DA SAÚDE (CCBS)

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André Jorge Silva Fonsêca

TIRAGEM

400 exemplares

A Revista de Ciências da Saúde é a publicação oficial do Centro de Ciências Biológicas e da Saúde (CCBS) da UFMA e tem por objetivo a divulgação de trabalhos originais produzidos nas áreas de Ciências Biológicas e Ciências da Saúde, por pesquisadores desta Instituição e de outras congêneres.

A publicação da revista é semestral e os exemplares são distribuídos gratuitamente aos autores dos artigos, departamentos, coordenações de cursos de graduação e pós-graduação, aos demais centros da UFMA e a bibliotecas de Universidades e Institutos de pesquisa do Brasil.

Atualmente a Revista do CCBS é classificada pela CAPES como qualis B5 e os trabalhos são avaliados por consultores *ad hoc* da UFMA e de outras instituições de ensino e pesquisa do Brasil.

Os conceitos e idéias emitidos nos artigos da Revista de Ciências da Saúde são de inteira responsabilidade dos seus autores.

EDITORIAL

Os eventos internacionais são importantes para consolidar as parcerias existentes, entre os grupos de pesquisa de várias partes do mundo. Favorecem a aproximação de novos grupos, estimulando a construção conjunta de projetos e ampliando as oportunidades de formação e qualificação de profissionais. Todas essas atividades têm impactos diretos no incremento da pesquisa e inovação, além das contribuições a população em geral. Os eventos internacionais contribuem também para dar maior visibilidade ao Estado no cenário internacional. Em relação aos benefícios indiretos, podemos salientar a visibilidade do Estado como pólo turístico e atração de pessoas de vários estados brasileiros e países, o que amplia a taxa de ocupação dos hotéis e movimentam a economia local.

O objetivo geral do 1º WORKSHOP EM CIÊNCIAS DA SAÚDE, um dos primeiros eventos internacionais nessa área no Maranhão, foi colocar alunos e pesquisadores em contato com os principais avanços em ciência, tecnologia e inovação em Ciências da Saúde, como forma de estimular a cooperação internacional e ampliação das interações acadêmicas voltadas a formação de pessoal, para que sejam multiplicadores de informação e geradores de novos conhecimentos, abordagens e tendências de pesquisa nas áreas de abrangência das Ciências da Saúde.

O evento teve grande importância estratégica, em função da emergência de proporcionar à comunidade científica maranhense a atualização necessária e estimular as reflexões sobre os principais avanços nas pesquisas translacionais, na pesquisa básica e na pesquisa clínica nas áreas de abrangência das Ciências Biológicas e da Saúde.

Nessa primeira edição o evento proposto teve como meta possibilitar a troca de experiências e estreitamento das interações técnico-científicas iniciadas com o Centro de Ciências da Saúde (Health Sciences Center) e outros Centros da Universidade Texas A&M - Texas A&M University - TAMU, nos Estados Unidos, a partir da cooperação já iniciada com a missão realizada no último mês de janeiro de 2015, que contou com o fundamental apoio da FAPEMA.

Os resumos apresentados durante o evento fazem parte do presente número da Revista de Ciências da Saúde da UFMA.

Boa leitura

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INFORMAÇÕES SOBRE O EVENTO:

Título do evento: 1º Workshop Internacional em Ciências da Saúde

Abrangência do Evento: Internacional

Caracterização: Evento científico e/ou de inovação, com abrangência e repercussão internacional, que teve como objetivo a promoção de publicações científicas e a interação entre acadêmicos do maranhão e de outros países.

Período de realização: 15 a 18/09

Página do evento: wics-ufma.com.br

POSTURAL EVALUATION OF SCHOLARS OF THE FUNDAMENTAL TEACHING, OF SÃO LUÍS - MA.

LIMA, Fernando César Vilhena Moreira

The purpose of this study was to evaluate the posture of the scholars of the public and private schools of Sao Luis-MA. They were selected in an aleatory way, of 29 schools, 862 students with average of 13,2 year-old age and stature 154,90 cm. The photographic registration was accomplished in the posterior and lateral view. The obtained images were digitalized and quantified through the version 2.1 Alcimagem software ®, applying the the principles of the computerized photogrammetry. The tabulation of the data and the statistical analysis were accomplished through the BIOESTAT 3.0 program. A general prevalence of 16,24% of the alterations distributed posturais in the following way was observed: 4,2% presented alteration of the angle of line of spinous process (ÂLE), 4,5% of the angle of unevenness of shoulders (ÂDO), 5,1% of the kyphosis angle (ÂCI) and 4,2% of the lordosis angle (ÂLO). This way, the importance of the accomplishment of posture evaluations periodically is pointed out in the school ambit, with the intention to prevent posture alterations that compromise your quality of life thereafter.

Keywords: Posture, Scholars, Photogrammetry.

ANALYSIS OF THE ADHESION STRENGTH OF ORTHODONTIC ACCESSORIES BONDING THROUGH SHEAR TEST

PEREIRA, Fernando César Augusto Abreu

The bracket fixation to enamel has been a critical issue in Orthodontics since the introduction of direct bonding, which is important to the biomechanical stability of the bracket/cement interface. To analyze and compare the in vitro bond strength of orthodontic brackets, through shear strenght test and evaluate the Adhesive Remnant Index. The 60 bovine teeth were sectioned and embedded into PVC pipes with chemically activated acrylic resin. The buccal surfaces were flattened and received prophylaxis. Then were divided into six groups: Group 1: metallic bracket + Transbond XT®; Group 2: metallic bracket + self-etching primer adhesive Adper Plus SE® and Filtek™ Z350 Flow; Group 3: metallic bracket + Vitremer®; Group 4: ceramic bracket + Transbond XT®; Group 5: ceramic bracket + Adper Plus SE® and Z350 and Filtek™ Z350 Flow; Group 6: ceramic bracket + Vitremer®. The shear test was conducted at a speed of 0.5 mm / min in a universal testing machine TIRAtest 2420, with a load of 50 N. Then, the fractured surfaces were evaluated using a stereomicroscope, with an increase of 15 times size to check the Adhesive Remnant Index. The results were tabulated and statistically analyzed by Kruskal-Wallis test, noting that there was a significant difference among the groups, p value = 0.000 (<0.05). The system Transbond XT® showed significantly higher values of resistance; the ceramic bracket showed the best performance; the group Transbond XT® + ceramic bracket showed statistically superior performance; the Adhesive Remnant Index showed that most fractures occurred at the bracket/composite interface.

Keywords: Shear Strength; Dental Bonding; Orthodontic Brackets.

EPIDEMIOLOGY OF SYPHILIS, GONORRHEA, HEPATITIS B AND C IN THE STATE OF MARANHÃO

MONTEIRO, Silvio Gomes

Sexually Transmitted Diseases (STDs) are the main responsible for medical care in the world, with economic consequences, social and important health. Even with preventive campaigns and advances in diagnostics, especially after the emergence of Acquired Immune Deficiency Syndrome (AIDS), continue to have high prevalence in different populations. The objective of this study was to evaluate the epidemiological profile of 5 STDs: gestational syphilis, congenital syphilis, hepatitis B and hepatitis C and gonorrhea in the state of Maranhão. The notifications to search for these diseases, was conducted by the SINAN database, covering common and specific variables for each disease, from 2003 to 2013. Initially it was made a descriptive analysis of all variables investigated, followed by mapping each of the cases DST in cities of Maranhão. To evaluate the associations between the various classificatory variables was the Chi-square test. The level of significance used in all tests was 5%. The results confirm high incidences of first four diseases STDs analyzed, whichever hepatitis C in the number of notifications. Blood transfusion was the main route to greater transmissibility of hepatitis B and C. Gonorrhea, for not constitute a reportable disease and treated informally presented extreme underreporting. We conclude this study, extreme vulnerability of the population analyzed, is the practice of unsafe sex or through other forms of transmission of etiologic agents. It emphasizes the need for sustained and intense government programs to combat STDs / AIDS, aimed increasingly informing the population in all municipalities on the contagion risk of these diseases and their consequences. Especially in regard to hepatitis C, silent disease can in its asymptomatic form, turning into long term liver cancer.

Keywords: Gestational Syphilis, Congenital Syphilis, Hepatitis B, Hepatitis C, Gonorrhea, Epidemiology

EFFECTS OF INSULIN THERAPY IN DIFFERENT CONCENTRATIONS ON TESTICULAR TISSUE OF DIABETIC RATS

JUNIOR, Valdemiro Amaro da Silva

The aim of this study was evaluate the effects of insulin treatment in different concentrations on testicular tissue of diabetic adult rats by the morphological analysis of spermatogenic process. Twenty-eight adult male rats were divided: 1) Control Group: received citrate buffer, by intraperitoneally injection; 2) Diabetic Group: induced by intraperitoneal injection of streptozotocin (60 mg/kg of body weight); 3) Insulina 50%: induced diabetes and treated with half of standard dosage of insulin; 4) Insulin 100%: induced diabetes and treated with standard dosage of insulin. After eight weeks, animals were weighted, anesthetized, testicles were removed and processed in resin. Body and testicular weight of diabetic rats decreased when compared to control group. These parameters increased after insulin therapy. Diabetic rats showed low testosterone but the levels were recovered after insulin treatment. Nuclear diameter and individual volume of Leydig cells decreased in diabetics animals and these parametes were increased after insulin therapy. Results showed that diabetes mellitus type 1 promoted alterations on reproductive parameters and the treatment of insulin was efficient to avoid the damages on testicular tissue. The control of plasma glucose concentration is important to maintain quality reproduction life in diabetic animals.

Keywords: Diabetes Mellitus; Leydig Cells; Insulin Therapy; Testis; Seminiferous Tubules; Testosterone

CHARACTERIZATION OF MORTALITY IN CHILDREN UNDER 10 YEARS OLD IN MARANHÃO IN THE 2002 TO 2011 PERIOD.

CACAU, Méllany Pinheiro

AIMS: To characterize mortality in children under 10 years in Maranhão in the years 2002 - 2011. **MATERIAL & METHODS:** this was a retrospective, a descriptive and quantitative study. Data were obtained from the death certificates of children aged from 0 to 9 years 11 months and 30 days and the Sheet Investigation of Infant and Fetal Death using information contained in the Mortality System (SIM). The main causes have been identified and the profile of children who evolved to death was traced from the age, year, city of residence, race / color and basic cause. The population is composed of 28,870 death certificates. Data were analyzed using STATA TABWIN programs and will be presented by graphics and tables. **RESULTS:** In Maranhao the number of infant deaths fell by 2.52% between the first and last year studied. The mortality rate in children and municipality of residence remained high in the state. The age group most affected are children under 1 year. The variable race / color the predominance of death is in the brown population. The main causes are: respiratory and cardiovascular disorders (20.74%), abnormal findings (72.4%), congenital malformations and deformities (10.53%), infectious and parasitic diseases (10.12%), perinatal infections (6.47%), external causes 5.47%, fetus and newborn affected by maternal factors (4.79%) and duration of delivery (4.64%). **CONCLUSION:** Mortality in children still causes concern because it is considered a health problem in the country, Maranhao still continues with high mortality rate, despite having reduced it. **Keywords:** Mortality, Children, Characterization, Maranhão, Period, Lower

IS OVERLOADING A MAJOR CAUSE OF TEMPORO-MANDIBULAR JOINT OSTEOARTHRITIS?

MOREIRA, Leonardo Victor Galvão

Temporomandibular joint osteoarthritis (TMJOA) is a complex joint disease, symptoms of which include severe pain and dysfunction. Yet, whether the role of overload in the pathogenesis of knee or hip osteoarthritis is widely supported, its relevance in TMJOA remains controversial. Aim: To review the literature in search of the current understanding of mechanisms underlying the impact of overloading on TMJOA pathophysiology. Material and Methods: Two independent investigators searched data sources up to 2015 by using the search algorithm “osteoarthritis” or “OA” or “arthritis”, and “temporomandibular joint” or “TMJ” or “temporomandibular”, and “overloading” or “overload” or “loading” or “load”. Databases utilized included ISI Web of Science, Medline, reference lists of relevant studies, and hand searches in key journals. Studies published in non peer-reviewed journals or in any language other than English were not considered. Results: Although no clinical study has been found, experimental studies and literature reviews were included. Studies investigating the relationship between TMJ overload and TMJOA are scarce, but the majority agrees that occlusal instability and stresses are likely to initiate TMJ degradation process. Furthermore, limited data have demonstrated that failures in adaptive mechanisms to bear loads may induce the development of altered frictional properties of condylar cartilage. As a result, enhancement of chondrocytes autophagy and release of pro-inflammatory or matrix degradation mediators are due, leading to destruction of TMJ through distinct signaling pathways. Conclusion: TMJ responses to loads have not yet been precisely mimicked in a physiological scenario. Nevertheless, in a disturbed one, overloading may trigger TMJOA-like changes.

Keywords: Temporomandibular Joint, Osteoarthritis, Load-Bearing, Inflammation, Cartilage, Degradation.

CINNAMALDEHYDE AS AN IMMUNOMODULATOR OF THE SYSTEMIC INFLAMMATORY RESPONSE SYNDROME INDUCED BY LPS: UNDERLYING MECHANISMS

MENDES, Saulo José Figueiredo

Cinnamaldehyde is a natural essential oil suggested to possess anti-bacterial and anti-inflammatory properties. However, the majority of the data obtained is from in vitro models. Here, we investigated the immunomodulatory actions of trans-cinnamaldehyde in the systemic inflammatory response syndrome (SIRS) induced by lipopolysaccharide (LPS, 11.25 millions EU/Kg; intraperitoneal), commonly used to study the inflammatory changes characteristic of sepsis in mice. Swiss mice received a single oral treatment with cinnamaldehyde (250 mg/kg), 1h prior to LPS injection. Vehicle-treated (10% DMSO in PBS) mice were used as controls. Cinnamaldehyde ameliorated SIRS severity but not organ damage in LPS-injected animals. Diminished numbers of circulating mononuclear cells were found in animals treated with cinnamaldehyde, whilst an increase in peritoneal mononuclear and polymorphonuclear (PMN) cell numbers was observed. Cinnamaldehyde treatment also augmented the number of peritoneal Ly6chigh and Ly6Clow monocyte/macrophage cells in LPS-injected mice. Reduced levels of nitric oxide, plasma TNF α and plasma and peritoneal IL-1 β were also detected. Additionally, IL-1 β levels were increased in cinnamaldehyde-treated LPS-injected animals. Overall, cinnamaldehyde reduces the severity of SIRS by modulating key events associated with this response, including the shift of monocyte/macrophage and polymorphonuclear cell populations; and inflammatory mediator release; suggesting this compound may be valuable to improve sepsis outcome.

This research was funded by FAPEMA, CNPq and CAPES

Keywords: cinnamaldehyde, sepsis, immunomodulator

BOTULINUM TOXIN TYPE A IN DENTISTRY THERAPEUTIC

SOUSA, João Paulo Dutra Lobo

The Botulinum Neurotoxin is the most potent biological toxin known to man and has been widely studied in dental therapy. This literature review aims to address the mechanisms of action of the neurotoxin Botulinum type A (NTBo-A) on the therapeutic effects, pondering the causes, prevalence and the correct indication of the dentist professional as a therapeutic measure in the treatment of symptoms of pain in dysfunction temporomandibular (TMD), tension headache and trigeminal neuralgia, as well as a less invasive treatment proposed in the gummy smile. By presenting such action characteristic of inhibiting the exocytotic secretion of acetylcholine at the level of the nerve motor terminals, the NTBo-A possess useful property in the treatment of many pathological conditions involving excessive muscle contraction, and the effect on acute pain (analgesic effect) and chronic pain (prophylactic effect). Thus the results show that NTBo-A shows employment potential in the dental surgeon operating area, enabling the treatment and control of pain, and restore aesthetic relations smile.

Keywords: Botulinum Toxin, Pain Control, Smile Gum.

HISTOMORPHOMETRIC EVALUATION OF TESTICULAR PARENCHYMA OF ADULT RATS SUBMITTED TO LOW PROTEIN SUPPLY DURING INTRAUTERINE AND POSTNATAL LIFE

JUNIOR, Valdemiro Amaro Da Silva

Spermatogenesis is a highly organized and coordinated process that depends upon the tight collaboration between the germ cells and somatic cells. Testicular somatic cells differentiate, proliferate and mature during intrauterine and postnatal life. Disorders such as dietary restrictions during these periods may permanently affect structurally and functionally an organism during adulthood. This study aimed to investigate the effect of low protein diet during intrauterine period and postnatal life on the adult testes. Female rats were mated, and after pregnancy confirmation, divided into four groups and fed during pregnancy and lactation: Control Group (CG), fed a normal protein diet; Undernourished Group (UG), fed a low protein diet; Postnatal Undernourished Group (PostUG), fed with normal diet during pregnancy and with the low protein diet during lactation; Prenatal Undernourished Group (PreUG), fed low protein diet during pregnancy and normal protein diet during lactation. Results showed that undernutrition during intrauterine period reduced epithelium height, Leydig cell volume and serum testosterone levels. When the protein supply was restricted during lactation period, epithelium height and Leydig cell population decreased. Rats submitted to low protein diet during the two periods had a reduction of seminiferous tubules volume, Sertoli cells population, Leydig cells population and volume and sperm production. Undernutrition during both the intrauterine and postnatal periods caused the most drastic testicular effects, as irreversible damage to Sertoli cell population and, consequently, to sperm production in the adult male.

Keywords: Protein Restriction, Testis, Spermatogenesis, Sertoli Cells, Leydig Cells

LEPROSY NEW CASE DETECTION TRENDS AND THE EFFECT OF PREVENTIVE INTERVENTIONS IN PARÁ STATE, BRAZIL: A MODELLING STUDY

MATOS, Haroldo José de

Aims. Leprosy is still a public health problem in Brazil. Although the overall number of new cases is declining, there are still areas with a high disease burden, such as Pará State. We aim to predict future trends in new case detection rate (NCDR) and explore the potential impact of contact tracing and chemoprophylaxis on NCDR in Pará State. **Materials and Methods** We used SIMCOLEP, an existing microsimulation model for the transmission and control of *M. leprae* in a population structured by households. The model was first quantified to mimic the population and observed NCDR of leprosy in Pará state for the period 1990 to 2014, which were then projected till 2050. The baseline scenario (i.e. current control program) included multi-drug therapy, passive and active case detection and BCG vaccination of infants. We investigated the impact of two additional interventions: contact tracing and administering single dose Rifampicin chemoprophylaxis. **Results** The modelled NCDR in Pará State after 2014 shows a continuous downward trend, reaching the official elimination target of 1:10,000 by 2030. Administering single dose Rifampicin chemoprophylaxis and implementing active contact tracing will add about 15% to the reduction of new cases in the next 25 years. **Conclusion** Our study indicates that the leprosy incidence will continue to decrease in Brazil. But elimination of leprosy as a public health problem can possibly be achieved up to 2030 and it could be brought forward through systematic contact tracing and the application of chemoprophylaxis.

Keywords: Leprosy; Epidemiology; Modelling; Microsimulation

***IN SITU* REMOVAL OF NAPHTHOQUINONES PIGMENTS FROM CELL SUSPENSION CULTURES OF ARNEBIA EUCHROMA (ROYLE) JOHNST.**

MALIK, Sonia

Arnebia euchroma (family Boraginaceae), is an important plant species of high altitude of the Himalayan region. Roots of this plant species are rich source of naphthoquinone pigments including; shikonin and their derivatives¹, which have been used as colorant in food, cosmetics and as a dye for textile industries^{2,3}. Besides, these have medicinal and pharmaceutical properties too. Cell suspension cultures of *A. euchroma* were raised from leaf derived callus and studied for the production of shikonin derivatives. Two-phase culture system was employed using liquid paraffin in the production medium to increase the production and release of these compounds from cells of *A. euchroma*. Content of shikonin derivatives was found to be enhanced by app. 2 fold as a result of in situ removal of shikonin derivatives from cells. HPLC analysis showed acetylshikonin as the major naphthoquinone derivative in the quantified fraction. There was also the possibility of re-cycling of cells. The present study would help in meeting the ever increasing demand of shikonin derivatives for their commercial production.

Keywords: Boraginaceae, Medicinal Plants, Plant cell suspension culture, Shikonin derivatives, Two-phase culture

INVOLVEMENT OF SULFHYDRYL GROUPS AND MUCUS PRODUCTION IN THE ANTIULCEROGENIC ACTIVITY OF THE ESSENTIAL OIL OF *Syzygium Cumini* (L.) SKEELS (MYRTACEAE)

CALDAS, Germana Freire Rocha

Aim: The aim was to evaluate the antiulcerogenic activity and the mechanisms of action involved in the gastroprotection of the essential oil from leaves of *Syzygium cumini* (EOSC). **Material and Methods:** Swiss mice (n = 6/group) were exposed to ethanol-induced gastric ulcer model for evaluation of antiulcer activity, levels of gastric mucus and for determination of the involvement of nitric oxide (NO) and sulphhydryl groups. Differences between groups were analyzed by ANOVA and Tukey's test (p<0.05). **Results and Conclusions:** The results showed that the pretreatment with EOSC (50, 100 and 200 mg/kg) protected the mice' gastric mucosa against ethanol-induced ulcer, significantly reducing the lesion area in 66.5, 93.9 and 96.5%, respectively. Treatment with EOSC (100 mg/kg) significantly increased the amount of mucus adhering to the gastric mucosa (99.7±12.9 µg Alcian Blue/g of tissue) compared to the control group (35.2±1.9 µg Alcian Blue/g of tissue). In pretreated group with L-NAME (NO-synthase inhibitor), the EOSC (100 mg/kg) decreased the gastric lesions in 91.3% (13.5± 4.1 mm²), thereby showing that its activity does not depend on NO. However, in pretreated group with N-ethylmaleimide (sulphydryl groups inhibitor), gastroprotective effect of EOSC was reduced to 25.5% (108.6±14.1 mm²), suggesting that this protective effect is dependent on the presence/production of sulphhydryl groups. The results indicate that the essential oil is a promising candidate for the treatment of gastric ulcer and that, cytoprotective mechanisms may be involved in protection of the gastric mucosa based on their ability to increase gastric mucus, given their interaction with sulphhydryl groups.

Keywords: *Syzygium cumini*. Essential oil. Gastric ulcer. Gastroprotection. Cytoprotective. Sulphydryl groups.

ANTI-ARTHRITIC EFFECTS OF *Chenopodium ambrosioides* L. IN AN EXPERIMENTAL MODEL.

CARTÁGENES, Gustavo Pereira Calado, Maria do Socorro
NASCIMENTO, Flavia Raquel Fernandes do

The chronicity of osteoarthritis (OA), characterized by pain and inflammation in the joints, is linked to a glutamate receptor, N-methyl-D-aspartate (NMDA). The use of plant species such as *Chenopodium ambrosioides* L. (Amaranthaceae) as NMDA antagonists offers a promising perspective. This work aims to analyze the antinociceptive and anti-inflammatory responses of the crude hydroalcoholic extract (CHE) of *C. ambrosioides* leaves in an experimental OA model. Wistar rats were separated into six groups (n=24): clean (C), negative control (CTL-), positive control (CTL+), CHE0.5, CHE5 and CHE50. The first group received no intervention. The other groups received an intra-articular injection of sodium monoiodoacetate (MIA) (8 mg/kg) on day 0. After six hours, they were orally treated with saline, Maxicam plus (meloxicam + chondroitin sulfate) and CHE at doses of 0.5 mg/kg, 5 mg/kg and 50 mg/kg, respectively. After three, seven and ten days, clinical evaluations were performed (edema formation, mechanical allodynia, mechanical hyperalgesia and motor activity). On the tenth day, after euthanasia, synovial fluid and lymph node drainage were collected for cellular quantification, and cartilage was collected for histopathological analysis. Finally, molecular docking was performed to evaluate the compatibility of ascaridol, a monoterpene found in CHE, with the NMDA receptor. After the third day, CHE reduced knee edema. CHE5 showed less cellular infiltrate in the cartilage and synovium and lower intensities of allodynia from the third day and of hyperalgesia from the seventh day up to the last treatment day. The CHE5 and CHE50 groups improved in forced walking. In relation to molecular docking, ascaridol showed NMDA receptor binding affinity. *C. ambrosioides* CHE was effective in the treatment of OA because it reduced synovial inflammation and behavioral changes due to pain. This effect may be related to the antagonistic effect of ascaridol on the NMDA receptor.

Keywords: Osteoarthritis; *Chenopodium ambrosioides*; MIA; NMDA; Molecular docking

EFFECTS OF *Borreria verticillata* (L.) G. Mey. IN MODEL OF NEUROPHATIC PAIN

GARCIA, Rosa Helena M Silva, João Batista
CARTÁGENES, Maria do Socorro

Borreria verticillata plant species from Brazil presents antipyretic, analgesic, anti-inflammatory. Evaluate the effects of *Borreria verticillata* on nociception model of neuropathic pain. METHODS: Dried leaves of *Borreria verticillata* were used to obtain the hydroalcoholic extract (EHBV). Induction of neuropathic pain was performed constriction of the sciatic nerve (Bennett and Xie). The animals were divided into three groups: constriction (GCT), saline (GSC), sham (GS). We evaluated the thermal hyperalgesia and mechanical allodynia on day 0, 1, 5 and 10 and after this period, serum biochemistry analysis was performed. In the assessment of hyperalgesia on day 5 increased by 130% to EHBV 500 compared to the GSC. Treatment with EHBV 100, 200 and 500 did not alter the mechanical allodynia when compared to GST saline on days 0, 1 and 5. The mechanical allodynia was reduced by 40,2% and 27.6% to EHBV 100 compared the GCT saline and EHBV 200 respectively in day 10. However, the EHBV 100an the same time increased allodynia by 34.2% and 27.6% compared to saline GCT and EHBV 200 respectively. The EHBV doses used did not cause changes in AST dosages, ALT, creatinine, urea, glucose, total cholesterol, HDL and triglyceride. However, EHBV 100 lowers HDL in 41.1% compared to the GS. Conclusion: The presented EHBV analgesic doses showed activity in treating neuropathic pain.

Keywords: Pain, Allodynia, Hyperalgesia

IMPACT OF METABOLIC SYNDROME IN MOLECULAR MARKERS OF OXIDATIVE STRESS AND SENESENCE IN BRAINS OF RAT ON DIFFERENT AGES

**PINTO, Bruno Araújo Serra
PAES, Antonio Marcus A.**

Our study aims to characterize the impact of metabolic syndrome on the progression of oxidative stress and senescence markers of neuronal cells in young, adults and middle-aged rats (90, 180 and 360 days, respectively). For this, we pretend evaluate the obesity development in animals induced by fructose rich diet about morphometric, biochemical and hormonal parameters; evaluate the glycemic profile and resistance to insulin framework; determine fatty deposits in liver and muscles and adipose cushions functional profile; analyze histopathological changes in key tissues; evaluate the effects of obesity on motor, cognitive and behavioral changes; characterize the deleterious effects related to oxidative stress and the effects of obesity on the activity of enzymes related to oxidative stress and antioxidant defense; investigate the impact of obesity on progression of cellular senescence and related changes; investigate the effect of obesity before the gene expression and protein signaling pathways on proteins involved in oxidative stress and cellular senescence process responses. This characterization is essential to the future study of antioxidants in preventing neuronal aging and neurodegenerative diseases.

Keywords: Metabolic Syndrome, Senescence, Oxidative Stress, Brain, Rat, Aging

SIMULTANEOUS PRESENCE OF HBsAg AND ANTI-HBs SEROLOGICAL MARKERS IN A SPECIFIC POPULATION OF HEPATITES B CARRIERS

**ALBUQUERQUE, Ingrid de Campos
FERREIRA, Adalgisa**

Objective. The aim of this study was to show anomalous serological profile (positive HBsAg and anti-HBs) in HBV carriers. **Materials and Methods.** This is a cross-sectional study performed in Maranhão municipalities of Urbano Santos, Axixá, Morros, Icatu and Humberto de Campos. 3987 individuals participated of this study during March 2012 and March 2016. The sample calculation was done by considering a prevalence of 0.5% of HBsAg. 12 individuals with simultaneous presence of HBsAg and anti-HBs participated of this work. This study was submitted to the research ethics committee of HUUFMA with approved consolidated opinion under number 448,731. **Results.** Most individuals were female (66.67%) and were under five and over 60 years of age (25.01%, respectively). Most of them had incomplete primary education (33.33%) and 50% did not know whether they had been immunized against hepatitis B. Most of them had stable relationship with a single partner (50.00%) and only sometimes used condoms (33.33%). They used to share nail cutters (33.33%) and hair tweezers (16.67%) although the shaver was individually used (41.67%). **Conclusions.** We conclude that this serological profile, not commonly found in clinical practice, needs due attention, because of implications in the effectiveness of the immunization by demonstrating that there are vaccinated individuals who did not develop immunity against hepatitis B. Furthermore, we observed that there may be problems in the prenatal care in positive HBsAg children under five years of age as well as negligence in the condom use and sharing of utensils that should be of individual use.

Keywords: Hepatitis B. HBsAg. Antibody. Mutation.

SERUM INFLAMMATORY MARKERS ASSESSMENT IN PATIENTS WITH CHRONIC PERIODONTITIS AFTER NON-SURGICAL TREATMENT

LOBÃO, Walder Jansen De Mello
PEREIRA, Antonio Luis A

Aim: Evaluate the impact of non-surgical periodontal treatment of CPD on concentrations of serum albumin, CRP, IL-6 and leukocytes in systemically healthy individuals with and without chronic periodontitis. **Materials and Methods:** This is an interventional study paired for both genders with blind assessment in patients with CPD, with a sample of 67 individuals, aged between 30 and 65 years old with at least 20 teeth and no systemic diseases diagnosed till the date of collections and interventions. Periodontal and laboratory data were collected. The groups were compared statistically significant according to the numerical and categorical variables; correlation test was employed, with significance level at 5%. **Results:** The data showed no statistically significant differences in gender, age and body mass index among the experimental groups. A reduction of the inflammatory periodontal parameters and inflammatory markers in serum 90 days after treatment for both groups was noted. There was a decrease in the leukocyte count after 90 days for the group with periodontitis, with no significant differences regarding the group with no periodontitis, except for eosinophils and also lymphocytes that showed an increasing in their rates in association with other experimental group. There was an increase in the number of leukocytes in the group with no periodontitis after 90 days, except for basophils and lymphocytes. **Conclusions:** There was no association between chronic periodontitis and serum inflammatory markers in both study groups, nevertheless a tendency to the reduction of serum inflammatory markers and organism's leukocyte counts was found in both groups 90 days after completion of the non-surgical periodontal treatment. **Keywords:** Chronic Periodontitis, serum albumin, C-reactive protein, leukocytes, IL-6.

FACTORS THAT CONDITION THE RESPONSE TO ERYTHROPOIETIN IN PATIENTS ON HEMODIALYSIS

SANTOS, Elton Jonh Freitas
MIRANDA, Alcione

Anemia is an inevitable complication of hemodialysis patients, the main cause is erythropoietin deficiency. Several erythropoiesis-stimulating agents (ESAs) are available for treating anaemia. However a piece of the people in hemodialysis even using ESAs continues anemic. The study aimed to determine factors associated with hemoglobin levels <10 g / dL of hemodialysis patients treated with recombinant human erythropoietin (epoetin alfa). **METHODS** This was A prospective longitudinal analytical study for a period of six months. We evaluated the clinical and laboratory characteristics. Anemia was characterized as a hemoglobin < 10 g / dL. A longitudinal logistic regression model with random effects was used for analyze the relationship of these parameters with the anemia. **RESULTS** were included 143 patients with a mean age of 48.08 ± 13.75 years, the male majority, with up to 8 years of educational instruction and hypertensive. The prevalence of anemia in the study period ranged from 23.91% to 43.80%, in the adjusted analysis, increasing the chance of anemia was negatively associated with age and positively with: body mass index, presence of hypertension, the ferritin, the resistance to erythropoietin Index and C-reactive protein. **CONCLUSIONS** We observed a high anemia prevalence and the factors associated were: age, nutritional status, hypertension, inflammation and recombinant human erythropoietin resistance. **Keywords:** Anemia; Chronic kidney disease; Hemoglobin; Hemodialysis; Erythropoietin

ETHNOPHARMACOLOGY, SCIENCE OF PEOPLE, AS A TOOL FOR INNOVATION?

**JUNIOR, Luciano Mamede de Freitas
ALMEIDA, Eduardo**

AIM - provides information about the ethnopharmacology in several existing publications seeking to exploit its potential as a tool for innovation and research of herbal medicines. MATERIAL AND METHODS - Data on ethnopharmacology were obtained by electronic search in Biological Abstracts, Chemical Abstracts, Medline, Lilacs, Web of Science, Science Direct, PubMed, Food & Drugs Administration, with journals, covering the period between 2000 and 2015 using as descriptors ethnopharmacology terms, use of medicinal plants and ethnobotany. RESULTS - were examined 57 publications ethnopharmacological studies, identifying strengths and weaknesses related to approaches to the traditional use of medicinal plants. The flora has an increasing number of plants and studies the use of the species by the people must predict the influence of some factors, such as the sampling and selection of covered individuals in ethnopharmacological surveys; the importance of properly defining the research objective for the data collection and analysis tool results in relevant information for research with medicinal plants; robustness of taxonomic information; the possibility of studies in communities on the use of plants be played on chemical and biological prospecting. Find a less number of plants that have a property of interest to a high level may be more relevant to find a larger number of plants with lower levels of activity. Conclusion - the ethnopharmacology is characterized as a tool for identifying new drugs since the study variables are validated and the methodological design is suitable for collection and interpretation of data.

Keywords: Herbal, Traditional Use, Ethnobotany

MECHANISMS INVOLVED IN HYPERTRIGLYCERIDEMIC RESPONSE OF RATS WITH IMPAIRED GLUCOSE TOLERANCE INDUCED BY GLUCOCORTICOIDS

**MELO, Danylo Noleto de Sousa
PAES, Antonio Marcus A.**

Glucocorticoids are the most anti-inflammatory drugs prescribed worldwide, with great therapeutic efficacy, but with high levels of side effects, especially metabolic. Recent studies in rodent models have shown that glucocorticoids administration induces changes in glycolipid metabolism, such as hypertriglyceridemia. However, there are no reports in the literature on the molecular mechanism triggering the increase of triglycerides. Aims: To characterize the mechanisms involved in hypertriglyceridemia due to impaired glucose tolerance induced by glucocorticoids in rats. Material & Methods: Wistar rats will be induced glucose intolerance by administration (ip) of glucocorticoid. Then will be evaluated metabolic changes in these animals through the determinations of serum and hepatic lipid profiles. Once confirmed these changes will be assessed protein markers related to hepatic insulin resistance and the assembly and secretion of VLDL particles to establish the relationship between glucocorticoid administration and development of hypertriglyceridemia.

Financial support: CAPES, FAPEMA and CNPq

Keywords: Glucocorticoids

INFLUENCE OF BREAST CANCER CELLS SUPERNATANT IN MORPHOLOGY AND FUNCTIONALITY OF RAW 264.7 MACROPHAGES

**ARAÚJO, Elza Maria Moraes de
AZEVEDO, Ana Paula**

Macrophages display a high plasticity, which allows them to adapt their phenotype in response to different environmental stimuli. The aim of the study was to evaluate the effect of the supernatant of breast cancer cell line (MCF-7) on the modulation of the change of immunophenotypic in RAW 264.7 macrophages.. 2x10⁵ RAW 264.7 cells were placed on 96-well culture plate containing 200uL of the RPMI-1640 medium. 1 hour after, the cells were pretreated or not with the supernatant of MCF-7 for 1 hour at a final concentration of 20% of the total volume. Then, the cells were washed with PBS, the medium were replaced and the cells were activated with LPS and incubated for 72 hours. The supernatant of the culture was collected and stored at -80C until cytokine profile analysis and nitric oxide (NO) assessment by flow cytometry and Griess reaction respectively. Following this, the cells will be detached with accutase solution and stained for flow cytometry analysis. The next step is evaluate the phagocytic activity of these cells to finalize the evaluation of the macrophages functionality after the treatment with cancer cells supernatant. Our results demonstrated that the soluble factors produced by cancer cells suppressed production of proinflammatory mediators such as nitric oxide (NO). We hope to demonstrate that soluble factors produced by tumor cells are capable to change the macrophage morphology and functionality, simulating what occurs in the tumor microenvironment. Still hope to check if the p38MAPK signaling pathway has influence in this process.

Keywords: Macrophages, tumor supernatant, p38 MAPK, RAW 264.7, MCF-7, immunophenotypic

ANTIULCEROGENIC ACTIVITY OF A SPECIES OF FAMILY MYRTACEAE

**SOUSA, Ana Kely Araújo de
BORGES, Marilene Oliveira Rocha**

Peptic ulcer is the most prevalent among diseases of the gastrointestinal tract in much of the world, with 7 to 13 million new cases diagnosed annually. In recent decades the incidence of peptic ulcer disease has declined in the Western world. However, even affecting about 2-10% of the population, it remains a public health problem in modern society. This study aims to investigate the antiulcer activity of a species of Myrtaceae family. Methods: ulcer induction by ethanol and indomethacin: After fasting, the animals are treated orally with saline, pantoprazole or extract; one hour after treatment, the gastric injury is induced by oral administration of ethanol or indomethacin; one or 4 hours later, the stomachs are removed for assessment of damage. Extract effect on gastric secretion: on an empty stomach will undergo anesthesia will be later connected the pylorus and treatments administered intraduodenally; within 4 hours after ligation the animals will be euthanized, gastric material will be collected and will be measured volume, pH and total acidity. Extract Effect on gastric mucus: fasted animals receive pre-treatment orally, one hour after oral receive ethanol; after one hour their stomachs are removed and stained with the dye alcian blue for 2 hours; After washing with magnesium chloride absorbance of the solution is read at 598 nm.

Keywords: antiulcerogenic; Myrtaceae

DOES ANTILEISHMANIAL GLUCANTIME® CAUSE DNA DAMAGE BY OXIDATIVE STRESS?

MOREIRA, Vanessa Ribeiro
PEREIRA, Silma Regina F.

Aims: To investigate if and how Glucantime interacts with mammalian DNA. **Methods:** We performed Comet assay in vivo using mice leukocytes and comet assay followed by FPG and Endo III digestion was performed, which remove oxidized DNA bases in infected by *L. infantum chagasi* and uninfected animals. To investigate mutagenicity, we carried out Micronucleus Test using mice erythrocytes. **Results:** Using uninfected animals, we demonstrated that Glucantime cause DNA damage in vivo and increased the frequency of micronucleated cells. Glucantime action evaluated in Balb C mice infected by *L. infantum chagasi*, showed the infection itself increased DNA damage and the frequency of micronucleated cells. Genomic lesions and mutations further increased when these infected animals were treated with Glucantime (800mg/kg) for 24h. In addition, there was no difference between infected animals and those infected animals receiving Glucantime, suggesting the occurrence of oxidation in both groups that presented genotoxic and mutagenic effects. Using Comet assay followed by FPG digestion in uninfected animals, we demonstrated that Glucantime itself induces oxidative damage in DNA base. To reinforce that Glucantime was inducing DNA damage by oxidation, we performed antimutagenic tests using Genistein and Vitamin C, compounds which have significant protective effects against oxidative stress. Genistein was able to reduce genotoxicity and mutagenicity induced by Glucantime, achieving basal frequencies observed in the negative controls. Similarly, vitamin C was able to reduce the genotoxic and mutagenic effects caused by the antileishmanial Glucantime. **Conclusion:** From our results, we suggest that Glucantime cause DNA damage by oxidative stress.

Keywords: Leishmaniasis. Genotoxicity. Mutagenicity. Antimonial. Antileishmanial. Oxidation.

Plasmodium vivax INDUCES INCREASED ACTIVITY OF THE ENZYME SUPEROXIDE DISMUTASE (SOD)

RIBEIRO, Bruno de Paulo
NASCIMENTO, Flávia Raquel Fernandes Do

High levels of reactive oxygen species are produced in malaria, including the superoxide anion. SOD is a metalloenzyme that has the property of dismutate superoxide anion, producing hydrogen peroxide and thus protecting cells account oxidative stress. In this work we evaluated the influence of *P. vivax* infection on the activity of SOD. All reagents used for determination of SOD activity were derived from the SOD assay kit following the manufacturer's guidelines. The SOD activity in plasma of patients was higher than in controls ($p \leq 0.05$). Patients had a median SOD activity of 77.88%, whereas in the control this activity was 60.47%. In the 48 h culture supernatant there was no difference between groups. The free radicals produced on malaria exert a dichotomous paper, because while contributing to the death of the parasite, also cause tissue damage in the host. Therefore, this increase in SOD activity in patients, while it may mean greater protection against the deleterious effects of ROS, also seems to be a parasite of the escape mechanism because, with their withdrawal in culture 48 h, the activity SOD in patients decreased to levels similar to the control group.

Keywords: *Plasmodium vivax*, malaria, SOD, ROS

INVESTIGATION OF THE ANTI-PLATELET ACTIVITY IN VITRO OF PHENOLIC COMPOUNDS ISOLATED FROM THE LEAVES OF *Syzygium cumini* (L.) Skeels VIA INHIBITION OF PROTEIN DISULFIDE ISOMERASE (PDI).

**SILVA, Samira Abdalla da
PAES, Antonio Marcus A.**

Protein disulfide isomerase (PDI) plays an important role in platelet aggregation in order surface proteins containing thiol in both ADP pathways - dependent and independent. Different mechanisms are proposed for anti-platelet aggregation activity of phenols. Among which can be attributed to increased production of prostacyclin by endothelial cells, which decreases the cAMP synthesis aggregation and inhibits the expression of platelet α IIb β 3 receptors. Objective: This study aims to investigate the effects of phenolic compounds identified in sheet *Syzygium cumini* (L.) Skeels on platelet aggregation in vitro and the molecular mechanism of interaction with the disulfide isomerase (PDI). Methods: to verify the inhibition of platelet aggregation, platelet rich plasma (PRP) will be tested with hydroalcoholic extract (HE) and rich in polyphenols extract (RPE) from the leaves of *S. cumini* at concentrations of 1, 3, 10, 30 and 100, 300 and 1000 μ g / ml with the agonists ADP aggregation (5 μ M) and thrombin 0,02U / mL. To evaluate the molecular targets of interaction of PDI with the compounds identified in the RPE, the computational analysis of the binding site and the molecular docking of phenolic compounds in the human PDI molecule will be conducted with the help of PyMOL programs and AutoDock Vina (<http://vina.scripps.edu/tutorial.html>), respectively. For the prediction of compounds and molecular interaction, will be used as criteria free energy generated by AutoDock Vina and analysis of ligand-receptor interaction. The structure of PDI was processed in pockets protein detection software, fpocket.

Keywords: Protein Disulfide Isomerase, Platelet Aggregation, *Syzygium cumini* (L.) Skeels

BABASSU OIL: POTENTIAL ADJUVANT TO IMMUNE RESPONSE

**SILVA, Mayara Cristina Pinto da
GUERRA, Rosane Nassar Meireles**

Babassu oil is predominantly composed of fatty acids, especially lauric acid. Lauric acid has immunomodulatory action on the production of cytokines and inflammatory mediators such as TNF- α , IL-1 β , PGE2 and LTB4. We evaluated the adjuvant action of babassu oil (*syn Orbignya phalerata Attalea speciosa* Mart.) the activation of T and B lymphocytes in mice immunized with ovalbumin (OVA), where as the production of antibodies and cytokines. Balb / c mice (6 animals / group) were immunized sc with OVA emulsified in Babassu oil (OVA + B) and compared to the animals in groups immunized with OVA in presence of the adjuvants: Montanide® ISA 720, CpG (ODN 1826 TCCATGACGTTCCCTGACGTT,) and aluminum hydroxide (ALUM). Two control groups were used, one immunized with non-adjuvanted OVA (OVA) and the other treated with saline (SALINE - NaCl 0.87%). Antibody production was measured by enzyme linked immunosorbent assay - ELISA and production of cytokines by Cytometric Beads Array (CBA). The immunization with OVA emulsified in babassu oil reduced IL-10 production and increased IL-2 production, IL-6, TNF- α and IFN- γ , and the concentration of IgG2a and anti-OVA IgG1 in comparison the OVA and SALINA groups. We conclude that the babassu oil has important adjuvant effect, for selectively stimulates the production of cytokines and increases the production of anti-OVA antibodies.

Keywords: babassu oil, immunoadjuvants, OVA, Montanide® ISA 720, CPG, Balb/C

ASSESSMENT OF STANDARDIZED EXTRACT OF PROPOLIS (EPP-AF®) ON IMMUNE RESPONSE IN EXPERIMENTAL CANDIDEMIA

FORTES, Thiare S
NASCIMENTO, Flavia Raquel Fernandes do

Propolis is a resinous balsamic material with a complex chemical composition. It is produced by bees from material collected from flowers with addition of mandibular secretions. This material is used for the protection of the hive front of infectious agents such as fungi, bacteria, viruses and insects. Among the antimicrobial activities of propolis have proven, the antifungal action against strains of *Candida albicans*. Aim: evaluate the effect of standardized extract of propolis (EPP-AF®) in immunosuppressed mice and infected by *C. albicans*. Mice of the C57Bl/6 strain were immunosuppressed for a week with dexamethasone (3 mg/kg) and in the eighth day were infected with *C. albicans* yeasts (2×10^6) via intraperitoneal. From the ninth day, the animals were separated into 3 groups. The control group received PBS and the other two groups received EPP-AF® in doses of 10 (EPP-AF® 10) and 100 mg/kg (EPP-AF® 100). All treatments were intraperitoneal. After 7 days of treatment, half the animals were sacrificed to assess the number of cells lymphoid organs (bone marrow, spleen and lymph nodes mesenteric) and peritoneal washing. For analysis of survival, the other half of the animals continued to be treated for over 8 days and were evaluated until the 20th day post-infection sweat. Results: in relation to survival, 100% of the animals of the group EPP-AF® 100 remained alive even after 20 days of infection. This survival was higher when compared to Control groups and EPP-AF® 10. In relation to organ lymphoids cellularity, animals in the group EPP-AF® 10 showed a significant increase in the number of bone marrow cells in relation to the Cand group and the EPP-AF® 100. The increased production of bone marrow cells was accompanied by an increase in the number of cells in the peritoneal and mesenteric lymphoid node washed in the group, EPP-AF® 100 when compared to the Cand group. However, this profile is not repeated in relation to the number of spleen cells, since the group EPP-AF® 100 presented a significant reduction in the number of cells in the Cand group. These results suggest that immune cells may be going through a process of activation, which reflects on the largest bone marrow cell production and increased cell proliferation in esplenócitos, at the same time, the reduction of cells in the lymph nodes can be recruited into the infectious focus. This picture, could justify the greater survival of animals. Conclusion: the EPP-AF® acts as an immunostimulant of the response of the host immune suppressed, inducing production, proliferation and recruitment of immune cells activated and, consequently, increased survival post candidemia.

Keywords: Extract of Propolis, Candidemia, Immune Response.

ANTIOXIDANT AND CYTOTOXIC ACTIVITY OF THE STINGLESS BEE GEOPROPOLIS (*Melipona fasciculata* Smith) OF MARANHÃO, BRAZIL

CUNHA, Mayara S
RIBEIRO, Maria Nilce S

Products of bees, such as propolis and geopropolis, are important sources of bioactive compounds. The geopropolis is produced by mixing vegetable resins plus salivary secretions wax and ground for several species of bees without sting as the genus *Melipona*. In recent years, studies with geopropolis produced by *Melipona fasciculata* Smith in different regions of the state of Maranhão, showed high levels of polyphenols, triterpenes and saponins and biological activities such as antibacterial, leishmanicidal, cytotoxic and antitumor. In seeking to achieve establishing of standards of identity and quality of geopropolis aimed to characterize the antitumor active principles of the extracts of geopropolis of *Melipona fasciculata* of Cerrado and Baixada (Lowlands) maranhense, performing hydroalcoholic extracts and fractions of geopropolis samples of the two regions, Cerrado (G1) and Baixada (G2), analyzing levels of phenolic compounds, chromatographic profiles of the extracts and fractions by liquid chromatography high performance (HPLC-UV-Vis), identification of major compounds by liquid chromatography coupled to mass spectrometry (CLAE- EM), antioxidant activity *in vitro* by free radical DPPH method and antitumor activity *in vitro* with Ehrlich tumor cells. The results showed that the extract derived Cerrado maranhense (G1) was the most active for antioxidant activity *in vitro* (EC50 5,53µg/mL) and its ethyl acetate fraction (FA1) was the most active causing 50% inhibition of the initial concentration DPPH concentration of less than 4µg/mL (EC50 3,64µg/mL) and also presented the highest content of total polyphenols (59.43%). The hexane fractions of both extracts showed no antioxidant activity and were the fractions that showed the lowest levels of total polyphenols. The chromatograms obtained by HPLC-UV-vis show that G1 and G2 have different chemical compositions. Ellagic acid and abiesatriene B were identified as major compounds G1 and G2, respectively, it is still identified gallic acid, glycyrrhetic acid and arjulonic acid.

Keywords: Terpenes, Tanins, Tumor Cells

MOLECULAR MECHANISMS INVOLVED IN THE EFFECTS HYPOLIPEMIAN AND ANTI-OBESITY OF *Syzygium cumini* leaves IN MSG-OBESSE RATS

FRANÇA, Lucas Martins
PAES, Antonio Marcus de Andrade

Syzygium cumini is a vegetal species very used by population to treatment of metabolic disorders. Previous evaluations with the *S. cumini* leaves hydroalcoholic extract (HE) showed hypolipemiant and antiobesity effects in obese rats induced by L-monosodium glutamate (MSG). Aims: Thus, this study aims to investigate the mechanisms of action this HE on lipid metabolism in MSG-obese rats. Material & Methods: MSG-obese and lean male Wistar rats with 12 weeks of life will be treated (v.o) with saline (0.1mL/10g; CTR and MSG groups) or HE in the 0.5 g/kg dose, for 4 week (n=6). Before and during this period will be realized the weight and feed monitoring, and Lee index. In the end of treatment, the insulin sensitivity will be evaluated by glucose and insulin tolerance tests, and by TyG index. In the sacrifice, blood samples will be collected for assessment of insulinemia and lipids and adipokines levels. The liver and white and brown adipose depots will be removed and weighed. One part of the retroperitoneal fat will be separated for *ex vivo* analysis of lipolytic activity. In part of liver will be evaluated its lipid content. Liver and retroperitoneal fat samples will be separated for histological analysis. Other samples these tissues will be stored for gene expression (RT-PCR) of lipogenic markers (PPAR γ , SREBP1c e DGAT2), lipid oxidation (PPAR α e CPT1), and triglycerides exportation (MTP and ApoB). Finally, for those markers with gene expression alteration will be realized Western blotting to determination of protein expression.

Keywords: *Syzygium cumini*; Obesity; Lipid metabolism.

DENTIN SENSITIVITY AT QUALITY OF LIFE IN PERIODONTAL PATIENTS

FERREIRA, Mônica Beatriz Portela

Abstract (250 words): The sensitivity of the dentin is caused by dentin exposure as a result of enamel loss and / or cement with short-term pain associated with thermal stimuli, chemical, evaporative or osmotic. The objective was to verify the presence of the sensitivity of dentin at different intensities and their impact on quality of life of periodontal patients. It examined 36 chronic periodontitis patients of both sexes aged 18-59 years at the Clinic of Dentistry, Federal University of Maranhão. The participants answered a questionnaire on socioeconomic status and oral hygiene habits. The impact sensitivity of dentin in quality of life was assessed by OHIP-14 (Oral Health Impact Profile). Clinically, the sensitivity of dentin was evaluated by the use of air-water spray and explorer No. 05, using the scores 0 to 3. Data were submitted to descriptive analysis. The results showed that 18 patients had a sensitivity of dentin, where the premolars were the most affected teeth (55.5%). The sensitivity of the dentin was more observed by the air-water spray (86.1%), then the explorer (51%). Discomfort / mild pain (score 1) was found more air-water spray (43.50%), whereas severe pain that persists after stimulation was more verified by explorer No. 05 (51%). The OHIP-14 showed weak impact (66.67%) to medium (33.33%) in patients with sensitive dentin. Individuals without sensitivity had little impact (94.44%). It was concluded that the sensitivity of the dentine affected part of periodontal patients with low to medium impact on quality of life.

Keywords: Dentin sensitivity. Intensity difference. Quality of life. Periodontal diseases. Chronic periodontitis. Oral Health.

OCCULT HEPATITIS B VIRUS INFECTION IN POPULATION WITH ISOLATED ANTI HBC

NUNES, Jomar Diogo Costa
FERREIRA, Adalgisa de Souza Paiva

Hepatitis B (HBV) is one of the most common infectious diseases globally, with some 300 million chronic carriers worldwide. The Brazilian Ministry of Health estimates that 15% of the country population has been exposed to HBV, and that the average rate of chronic carriers in the capital cities of Northeast Brazil is approximately 0.5%, according to a national survey. HBV can persist the liver form of the hepatitis B virus called occult chronic hepatitis B (HBO) has recently been described. As the area of Maranhão where is being held the prevalence study is moderately endemic, one would assume that we have cases of HBO in this population. Another rationale for this research is related to the research of occult hepatitis Delta (HDO), a fact recently described and can be a public health problem in our state. This infection has been recently described among chronic hepatitis B patients with undetectable HBsAg in Switzerland and in Argentina. The hypothesis of this research is the highest prevalence of hepatitis B in patients with occult anti-HBc alone, where the mutational alterations present in HBV would be responsible for identifying the absence of HBsAg by immunological techniques (ELISA). Another hypothesis is that patients in this region can also be infected with HDV in a hidden way.

Keywords: Occult; hepatitis Delta; hepatitis B; anti-HBc; HbsAg; ELISA

EFFECTS OF ISOLATED COMPOUNDS FROM *Syzygium cumini* (L.) SKEELS LEAVES OF THE SYNTHESIS AND EXPORT OF TRIGLYCERIDES IN RAT HEPATOCYTES WITH OBESITY INDUCED BY MONOSODIUM L-GLUTAMATE

CHAGAS, Vinicyus Teles
PAES, Antonio Marcus de Andrade

Introduction: Hypertriglyceridemia is an essential feature of the metabolic syndrome and is associated with increased risk of developing cardiovascular disease. The deregulation of metabolism of triglyceride-rich lipoprotein observed hypertriglyceridemia causes insulin resistance, hepatic state that induces hypersecretion of VLDL. VLDL assembly is conducted by microsomal triglyceride transfer protein (MTP), a heterodimer resident chaperone in the lumen of the endoplasmic reticulum that catalyzes the incorporation of neutral lipids for apolipoprotein B. The pharmacological inhibition of MTP activity reduces production of VLDL the risk of developing atherosclerosis, however, promote elevated serum transaminase levels due to the large accumulation of lipids in the hepatocytes. Compounds of the plants as flavonoids are reported as liver MTP inhibitors, however, without causing injury to hepatic tissue. *Syzygium cumini* (Myrtaceae) is a species with high polyphenols content, mainly flavonoids and holder of several pharmacological properties as anti-hyperglycaemic activity, cardioprotective, hepatoprotective, hypolipidemic among others, described mainly for its seeds. Thus, we propose in this paper to evaluate the anti-hypertriglyceridemia effect of polyphenols present in the leaves of *S. cumini* in isolated hepatocyte-MSG obese rats. **Methods:** extract rich in polyphenols Preparation of maceration (Solvent: water/ethanol/chloroform/ethyl acetate). Isolation and characterization of its leaf content by HPLC-MS. Protein Expression of Insulin-MTP axis (IRS, PI3K, Akt / PKB and FoxO1 MTP) by western blot. Prediction of polyphenols isolated interaction with proteins of the insulin-MTP axle by docking. **Results and conclusion:** work in progress.

Keywords: *Syzygium cumini* , Triglycerides, Rat, Hepatocytes, Obesity, Monosodium L-Glutamate

COPING SPIRITUAL IN PATIENTS WITH MYOCARDIAL REVASCULARIZATION CORONARY BLOOD DISEASE

**NUNES, Joana Kátya Veras Rodrigues Sampaio
NETO, José Albuquerque de Figueiredo**

Introduction: “Coping” English word meaning “handle”, “face”. The Coping Religious/Spiritual are strategies or set of behavioral strategies that the individual uses as coping with health conditions (MELAGGI, 2009; PANZINI, 2010). The CRE these strategies seem to relate to improved health, increased life expectancy (PINTO; PARENTS-RIBEIRO, 2007). In patients undergoing cardiac surgery, the CRE was associated with reduced psychological stress levels, decrease anxiety, depression and post-operative complications (AI et al, 2010). Lucchese, Koenig (2013), examined the mechanisms that help explain the associations and clinical implications, between Religion, Spirituality (R / S) and coronary artery disease (CAD) involving, risk factors such as arterial hypertension (HA) Cerebrovascular accident (CVA), Social Support aspects (AS) and Behavioral aspects (AC), depression (Dp), Anxiety (A), procedures Surgical Cardiac and mortality among them is the relationship religion / spirituality as results of predictive satisfactory health of the patient after surgery and complications when there is frequency of prayer and the meaning that it realizes on the spiritual support. Objective: To analyze the patients’ perception of support R/E in fighting the health - disease and compare the entity results CREP and CREN with depression and anxiety preoperatively and postoperatively (three, six, and twelve months of follow-up). Method: The study is an open-label trial, a prospective, longitudinal and analytical. Results: The project is the first data collection preoperatively with 15 patients who agreed to participate. Conclusion: Coping and the use of R/E as a coping measure is reported in the studies as improvement strategy prognosis and quality of life in patients with cardiovascular disease and heart postoperatively. **Keywords:** Coping Religious Spiritual; Coronary Artery Disease; anxiety; Depression.

HEPATITIS B VIRUS (HBV) PREVALENCE IN A SPECIFIC POPULATION OF MARANHÃO STATE

**SOUZA, Marinilde Teles
FERREIRA, Adalgisa de Souza Paiva**

Objectives. Prevalence of hepatitis virus (HBV) in a specific population of Maranhão state. Materials and Methods. This is a cross-sectional study performed in the municipalities of Urbano Santos, Humberto de Campos and from the *Baixo Munin* region in the state of Maranhão, Brazil, from March 2012 to March 2016. This study also investigates the relationship between genotypes and serological markers of viral replication as well as the correlation of viral replication frequency and HBV genotypes. The sample calculation was done by considering a prevalence of 0.5% of HBsAg and 95% of confidence level. This study was approved by the research ethnics committee of HUUFMA under consolidated opinion nº 448,731. Results. Most individuals were male (52.21%) and 60.29% were between 10 and 39 years of age. Most of them had stable relationship with a single partner (53.68%). All samples were screened to HBsAg serological marker and 136 were found positive for HBV (3.41%), which is equivalent to an intermediate prevalence. Conclusions. We may conclude that the intermediate prevalence of HBV found in this study is epidemiologically significant. The identification of chronic carriers in the group age, which includes minors, may be linked to vertical transmission with association to HBV carriers in viral replication.

Keywords. Hepatitis B, HBeAg, Genotype, Replication

VALIDATION OF *PAIN QUALITY ASSESSMENT SCALE* TO BRAZILIAN PORTUGUESE

CARVALHO, Anamada Barros
GARCIA, João Batista Santos

Introduction: The scale of neuropathic pain (EDN) was developed to meet the need for a brief measure of neuropathic pain. However, a number of pain qualities that are common among people with neuropathic and non-neuropathic pain are not evaluated by the EDN. To circumvent this limitation, additional items were added to the EDN, creating a 20-item scale (Pain Quality Assessment Scale PQAs), which has a higher content validity in the evaluation of neuropathic and non-neuropathic pain. The PQAs is a self-report instrument used in clinical practice to assess the quality of pain, assessing the patient's perception about their treatment or medical condition; although such a scale is not specific for peripheral neuropathy evaluation induced by chemotherapy (CIPN) constitutes a useful tool for assessing the quality of neuropathic pain in cancer patients who perform chemotherapy; however, to be used is of fundamental importance to implement psychometric tests of the scale validation. **OBJECTIVE:** To validate the instrument Pain Quality Assessment Scale (PQAs) for the Portuguese of Brazil. **METHODOLOGY:** From a convenience sample were selected 140 patients, collected data for the age, type of cancer, diagnostic time and time of pain and applied the PQAs and DN4 questionnaire. The last step was to validate the scale with the reliability test using Cronbach's Alpha. **RESULTS:** Of the 140 patients, most were women (104 patients). The age range was between 20 and 65 years, with a median of 51 years. The most prevalent cancer among women was to cervical, since among men was the lung. Reliability testing was calculated Cronbach's alpha and the value obtained was 0.91. **CONCLUSION:** PQAs showed good reliability and high internal consistency can be used as an important tool for assessment of pain, either neuropathic or non-neuropathic pain. Other psicometric tests are in progress in the validation study.

Keywords: Neuropathy. PQAs. Validation of the scale.

OCCULT HEPATITIS B AMONG PATIENTS WITH CHRONIC RENAL FAILURE ON HEMODIALYSIS FROM A CAPITAL CITY IN NORTHEAST BRAZIL

**FONTENELE, Andrea Martins Melo
FILHO, Natalino Salgado
FERREIRA, Adalgisa Sousa Paiva**

Occult hepatitis B (OHB) is characterized by the presence of HBV-DNA in the absence of HBsAg in the serum of patients. Hemodialysis patients are at high risk for hepatitis B virus and there are few data on the prevalence of OHB in this population, mainly in Brazil. Thus, the aim of this study was to determine the prevalence of OHB in patients undergoing hemodialysis. A cross-sectional study was performed, including 301 patients on chronic hemodialysis at two dialysis centers in São Luís (Maranhão), northeast Brazil. Serological tests were performed for HBsAg, anti-HBc, anti-HBs, and anti-HCV using enzyme immunoassays (ELISA); HBV-DNA and HCV-RNA were studied by real-time PCR. The mean age was 49 ± 15 years, and 128 (42%) were female. Serological tests confirmed that all samples were HBsAg negative. Anti-HBc was positive in 114 (38%) patients, anti-HBc and anti-HBs were simultaneously positive in 104 (35%), and anti-HBc alone was positive in 10 (3%). Tests were negative for anti-HBc and anti-HBs in 55 patients (18%). Anti-HBs was the only positive marker in 132 (44%) patients. Anti-HCV was positive in 15 (5%) patients with HCV-RNA present in 14 of them (93%). HBV-DNA was positive in seven cases (2.3%). There was no association of HBV-DNA with age, gender, time on dialysis, previous kidney transplant, or HBV serological pattern, but there was a positive correlation with the presence of anti-HCV ($P < 0.001$). OHB in chronic renal failure patients on hemodialysis appears to be a relevant finding, suggesting that studying HBV-DNA in this population using sensitive molecular tests should be a recommended course of action, especially in candidates for renal transplant.

Keywords: Hemodialysis, HBV, HCV, occult HBV, real-time PCR

ENDOCRINE AND METABOLIC PROPERTIES OF PHENOLIC COMPOUNDS IN THE LEAF *Syzygium cumini* (L.) Skeels: EFFECTS ON OVARIAN PHYSIOLOGY AND FERTILITY IN FEMALE RATS WITH POLYCYSTIC OVARY SYNDROME.

**VALE, Caroline Castro
PAES, Antonio Marcus De Andrade**

The polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders in women of reproductive age. It is associated with clinical and metabolic disorders primarily related to insulin resistance. As a treatment, insulin sensitizers have shown beneficial effects, however, the use of hypoglycemic drugs of natural origin have been investigated by the scientific community. Several medicinal plants are studied as insulin stimulators, among these, the species *Syzygium cumini* (L.) Skeels, popularly known as jambolan. To obtain the hydroalcoholic extract (SH) leaves were pulverized and macerated with 70% and ethyl alcohol in a ratio of 1: 6 w / v, followed by filtration and centrifugation, the supernatant was concentrated on rotaevaporator to low pressure and temperature of 45° C. Wistar rats will be used, the *Rattus norvegicus* whose female offspring from the second day of life, receive subcutaneously solution of monosodium glutamate (MSG), at a dose of 4 g / kg / day on alternate days for 10 days for induction model. After 75 days, the animals will be divided into four groups (n = 9-12): control (CTR) and positive control (SOP- CTR) treated with saline (0.1 ml/100g) and treated with EH. *S. cumini* dose (500 mg/kg/day). The treatment will last 30 days, during which will be evaluated parameters such as estrous cycle, body weight, biochemical, hormonal, TTG, TTI and evaluation of reproductive performance. With this set of experiments is expected to verify the effects of EH *S. cumini* on endocrine-metabolic processes and fertility in rats with PCOS-induced MSG.

Keywords: *Syzygium cumini* (L.) Skeels, Polycystic Ovary syndrome, Fertility

RESEARCH ACTIVITY OF ANTI-PLATELET AGGREGATION IN VITRO OF PEPTIDE INHIBITORS DISULFIDE ISOMERASE PROTEIN - STEP 2

**SOUSA, Hiran Reis
SANTOS, Ana Paula Silva de Azevedo de
PAES, Antonio Marcus de Andrade**

Faced with the clinical need to improve the efficacy and safety of current platelet antiplatelet therapies and considering the small number of platelet receptors whose mechanisms are effectively characterized the search for drugs that act via redox mechanisms have been the focus of research and new drug developments for the prevention and treatment of thrombotic diseases. This research project intends to continue the investigations initiated in previous works in Experimental Physiology Laboratory at the Federal University of Maranhão (LeFisio-UFMA), which tested the effectiveness of synthetic peptides to inhibit platelet aggregation via inhibition of protein disulfide isomerase enzyme (PDI). For this, they employed the same peptides used in work Paes et. al., (2011), which demonstrated an inhibitory effect of the reductase activity of the POI. The PDI's isomerize the disulfide bridges of $\alpha 2B\beta 3$ integrin, a fibrinogen receptor whose function is to bind to proteins, especially fibrinogen and stabilizes the platelet thrombus. Through the isomerization of disulfide bridges $\alpha 2B\beta 3$ integrin, it acquires a new spatial conformation and exposes the binding site (RGD portion) with fibrinogen. This project is to examine this inhibitory effect of platelet aggregation by the peptides in a purified system of platelets (washed platelets) and another system that is closest to the circulatory system (whole blood) with two complementary techniques: Turbidimetry (aggregometer) and characterization immune (flow cytometry). Currently, we completed the turbidity stage and will continue to eat the immunological characterization staumoge. Our results show to be quite exciting.

EFFECTIVENESS OF ACUPUNCTURE IN THE ADJUVANT TREATMENT OF CHRONIC HEADACHE

MAYRINK, Wildete Carvalho
SANTOS, Alcione Miranda dos
GARCIA, João Batista Santos

Chronic headaches are considered a matter of public health. Over 90% of the population had or will have at least one headache crisis in life, and 50% have them regularly. The aim of our research is to evaluate the effectiveness of acupuncture in the adjuvant treatment of chronic headache, quantifying its analgesic effect and impact on patients quality of life. This is an experimental, cross , random study with a sample of thirty four female patients between 18 and 60 years old directed by the Federal University of Maranhão Outpatient Chronic Pain, undergoing sixteen acupuncture sessions, two times a week, and were divided into two groups: true acupuncture, which are used conventional acupoints for Traditional Chinese Medicine for the headache treatment; and placebo acupuncture, where needles are inserted at the same points, but in an adhesive, moxa on button, which contains in its center one chinese herb conglomerate that will only serve to fix the needle out of the skin. Patients are evaluated by clinical pain. The results of true acupuncture and placebo in pain intensity will be analyzed using the Mann-Whitney test, and the effect of the sessions comparing the before and after will be through the Wilcoxon test. The Quality of Life will be evaluated by the McNemar test. In all tests the significance level will be 5%, which is considered significant when $p < 0.05$. Out of the thirty-four patients, twenty-eight completed the sixteen sessions and six are conducting sessions with completion scheduled for the 30th of September, from when we will begin to analyze the data.

Keywords: Headache, Acupuncture, Quality Of Life

EFFECTS OF STATIC STRETCHING IN SEDENTARY SENIORS

BEZERRA, Lara de Albuquerque Paulo

Abstract (250 words): The presente research work studying the aging process and the changes in the functional capacity of women. The problem of research was to investigate which of the effects of a static stretching program in sedentary elderly, having as objectives, acess flexibility, check and compare the range of motion of the joints of the shoulder, wrist, hip and knee of sedentary elderly before and after a quarterly program static stretching. This is a cross- sectional study in descriptive sampling method with quantitative approaches, which was held in a private College of Teresina- Piauí. The study sample was intentional involving 20 elderly aged ≥ 60 years. To evaluate the flexibility goniometry was performed to measure the range of motion of the shoulder joints (flexion, abduction and rotation), wrist (flexion, extension and deviations), hip (flexion, abduction and rotation) and knee (flexion) and applied the sit and reach test proposed by Wells and Dillon. Static stretching program was applied weekly on Mondays and Thursdays in the morning shift with duration of 15 minutes performing 14 exercises with permanence of 6 seconds in the positions indicated and a series of three repetitions (1 x 3). Data analysis was performed by means of descriptive statistics with mean values and standard deviation and the comparison performed by F- test and T- tes $p < 0.05$. According to the results found in this study allowed to conclude that the static stretching program did not interfere in the gain of particular range of motion, it ir suggested that probably by the amount of weekly sessions have been insufficient and the overweight of some older, which made the implementation of stretching, however it an be affirmed that the stretching program developed contributed, physiologically, for the maintenance of flexibility avoiding changes characteristic of age.

Keywords: Flexibility. Elderly. Physiotherapy

NORMAS DE PUBLICAÇÃO

A Revista do CCBS tem por finalidade publicarem caráter prioritário trabalhos científicos, desenvolvidos por pesquisadores, docentes de graduação e pós-graduação, alunos ligados aos departamentos que integram o Centro de Ciências Biológicas e da Saúde. Destina-se também à publicação de artigos de interesse para as Ciências da Saúde, desenvolvidos em outros departamentos da UFMA ou por instituições de pesquisa.

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Os originais deverão ser redigidos em português, de acordo com a norma culta do idioma nos seus aspectos morfológicos e sintéticos. O abstract deverá ser corrigido por um nativo da língua inglesa antes da submissão.
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Ex.: Estudos com ressonância magnética demonstram várias mudanças na articulação temporomandibular antes desconhecidas¹⁸.
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Ex.: Sano¹⁸ (2000) cita que estudos com ressonância magnética demonstram várias mudanças [...] Sano¹⁸ (2000) afirma que os estudos com RM demonstram várias mudanças [...].

- c) Trabalhos de um mesmo autor, de um mesmo ano, acrescentam-se à data, letras minúsculas do alfabeto latino sem espaçamento.

Ex.: Para Sano¹⁸ (2000a) estudos com ressonância magnética demonstram várias mudanças [...]. Sano¹⁹ (2000b) cita que estudos com ressonância magnética demonstram várias mudanças [...].

- d) Quando houver coincidência de autores com o mesmo sobrenome e mesma data, acrescentam-se as iniciais de seus pré-nomes.

Ex.: Para Sano¹⁸, L. (2000) estudos com ressonância magnética demonstram várias mudanças [...]. Sano¹⁹, M. (2000) cita que estudos com ressonância magnética demonstram várias mudanças [...].

- e) Quando o trabalho pertencer a dois autores, indica-se o sobrenome dos dois autores, separados por uma vírgula, seguido do ano.

Autor incluído na sentença
De acordo com Kreiborg, Cohen⁹ (1992), os fenômenos mais pronunciados antes da [...].
Autor não incluído na sentença
Ex.: Os fenômenos mais pronunciados antes da⁹ (mesmo que item 4, letra a).

- f) Quando se tratar de trabalhos de mais de dois autores, indica-se o sobrenome do primeiro, seguido da expressão latina et al., e o ano.

Autor incluído na sentença
De acordo com Abreu¹ et al. (1990), os fenômenos mais pronunciados antes da [...].
Autor não incluído na sentença
Ex.: Os fenômenos mais pronunciados antes da¹ (mesmo que item 4, letra a)

- g) Quando se tratar de publicações diferentes, indica-se o sobrenome dos autores e o ano.

Autores incluídos na sentença
Abreu¹ et al. (1990), Kreiborg, Cohen⁹ (1992) e Sano¹⁸(2000) afirmaram que os fenômenos mais pronunciados antes da [...].

Autores não incluídos na sentença Ex.: Alguns estudos^{1,9,18} têm investigado os fenômenos mais pronunciados antes da [...].

- h) Os trabalhos publicados por entidades coletivas, deve ser mencionada a fonte, entre parênteses, no final da citação.

Ex: Sistema Educacional Brasileiro obedece a normas e metas consultivas (BRASIL³,1990).

- i) Citado por outros autores (apud)

Abreu et al. (1990 apud Cohen⁹, 1992) afirma que um determinado grau de respostas [...].

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As referências devem ser elaboradas obedecendo ao disposto no Estilo Vancouver. Todo autor citado deve constar em lista chamada REFERÊNCIAS, devendo ser ordenados alfabeticamente pelo sobrenome do primeiro autor ou pela primeira palavra do título (quando sem autoria), antecedido de numeração progressiva. Os títulos de periódicos devem ser abreviados de acordo com o *index to Dental Literature* e impressos sem negrito, itálico ou grifo, não devendo ser pontuados e tendo a mesma apresentação em todas as referências. Nas publicações com até seis autores, citam-se todos; acima de seis autores, cita-se o primeiro seguido da expressão latina et ai. Comunicações pessoais, trabalhos em andamento e os não publicados não devem ser incluídos na lista de referências, mas citados em notas de rodapé.

5.1 Exemplos

a) Livros

Livro com um autor

Madeira MC. Anatomia da face. 2ª ed. São Paulo: Sarvier; 1997.

Livros com dois autores

Stock CJR, Nehammer CF. Endodontia na prática clínica. 3ª ed. São Paulo: Pancast; 1994.

Livro com até seis autores, citam-se todos. Acima de seis autores, cite os seis primeiros seguido da expressão et al.

Livro em suporte eletrônico

Braselli A. Toxoplasmose. [monografia online]. [citado 2003 jan 30]. Disponível: URL: [http:// www.infecto.edu.uy](http://www.infecto.edu.uy)

Ueki N, Higashino K, Ortiz-Hidalgo CM. Histopathology [monografia em CD-ROM]. Houston: Addison Books; 1998. [citado 2002 fev27]. Disponível em: URL: <http://www.hist.com/dentistry>

Capítulo de livro

Puricelli E. Retenção dentária. In: Gonçalves EAN, Feller C. Atualização dentária na clínica odontológica. São Paulo: Artes Médicas; 1998. p. 3-28.

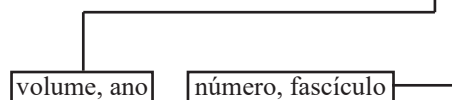
Capítulo de livro em suporte eletrônico

Wada CS. Determinações bioquímicas. In: Moura RA, Wada CS, Purchio A, Almeida TV. Técnicas de laboratório [monografia on-line]. São Paulo: Atheneu; 1998. [citado 1999 maio 27]. Disponível em: URL: <http://www.sinuses.com/postsurg.htm>

b) Artigo de periódico

Com um autor

Varella JAF. Fatores biológicos no preparo da cavidade. Rev Assoc Paul Cir Dent 1961; 15(3): 149-154.



Com dois autores

Jürgensen CA, Jürgensen LD. Passivação do cobre, alternativa para obtenção da condição de anaerobiose. Rev Brás Pat Clin 1982; 18(3):58-63.

Com mais de seis autores

Zoitopoulos L, BrailsforDSR, GelbierS, Ludfore RW, Marchant SH, Beighton D, et ai. Dental caries and caries-associated microorganisms in the saliva and plaque of 3 and 4-year-old afro-caribbean and caucasian children in south London. Archs Oral Biol 1997; 41(11):1011-1018.

Em suporte eletrônico

Szwarcwald C, Barbosa Jr A, Fonseca MGR Estimativa do número de crianças (O a 4 anos) infectadas pelo HIV. Brasil. 2000. [citado 2002 mar 12]. Disponível em: URL [http:// www.aids.gov.br/final/artigo.htm](http://www.aids.gov.br/final/artigo.htm).

Resumo

Varella JAF. Fatores biológicos no preparo da cavidade [resumo]. Rev Assoc Paul Cir Dent 1961; 15(3): 149.

Sem indicação de autor

The residual caries dilemma. *Comm Dent Oral Epidemiol* 1999; 22(2):439-441.

Volume com suplemento

Basting RT, Serra MC, Paulillo LAMS. Preparos de cavidades na era da dentística restauradora. *Rev ABO Nac* 2000; 8 Suple 1:176-181.

Fascículo sem indicação de volume

Jürgensen CA, Jürgensen LD. Passivação do cobre, alternativa para obtenção da condição de anaerobiose. *Rev Brás Pat Clin* 1982; (3):58-63.

Sem indicação de volume ou fascículo

Jürgensen CA, Jürgensen LD. Passivação do cobre, alternativa para obtenção da condição de anaerobiose. *Rev Brás Pat Clin* 1982:58-63.

Artigo citados por outros autores (apud)

Hellwig E. Clinical evaluation of chemomechanical caries removal in primary molars and its acceptance by patients (2001) apud Maragakis GM, Hahn P, Hellwig E *Caries Rés Sept* 2001; 35(3):205-210.

c) Dissertações e teses

Alves CMC. Análise morfométrica dos melanossomos presentes no interior do queratinócito na gengiva normal e inflamada em humanos [Dissertação de Mestrado]. São Paulo: Faculdade de Odontologia da USP; 1996.

Em suporte eletrônico

Azevedo VMNN. Avaliação clínica de pacientes portadores de lesões dentárias cervicais não cariosas relacionadas com alguns aspectos físicos, químicos e mecânicos da cavidade bucal [Tese em CD-ROM]. Bauru: Faculdade de Odontologia da USP; 1994.

d) Trabalhos apresentados em evento

Debortoli G. Ecoinformação: aquisição e uso da informação na preservação dos recursos naturais. In: 20º Congresso Brasileiro de Biblioteconomia, Documentação e Ciência da Informação: 2002; Fortaleza. Anais. Fortaleza: Centro de Convenção do Ceará; 2002. p. 50-65.

Em suporte eletrônico

Aun MP. Antigas nações, novas redes: as transformações do processo de construção de políticas de informação [CD-ROM]. In: 20º Congresso Brasileiro de Biblioteconomia, Documentação e Ciência da Informação: 2002; Fortaleza. Anais. Fortaleza: Centro de Convenção do Ceará; 2002. p. 90-101.

e) Leis, decretos, portarias etc.

Brasil. Lei nº 8926, de 9 de agosto de 1994. Torna obrigatória a inclusão, nas bulas de medicamentos, de advertências e recomendações sobre seu uso por pessoas de mais de 65 anos. *Diário Oficial [da] República Federativa do Brasil*, Brasília 1998; 126(190):19291-19292.

Brasil. Decreto-Lei nº 2481, de 3 de outubro de 1998. Dispõe sobre o gesto provisório para o médico estrangeiro em situação ilegal em território nacional, *diário oficial [da] Republica Federativa do Brasil*, Brasília 1998; 126(192):19292-19295.

6 ENTREGA DE ORIGINALS

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