
Accepted Abstracts

Probiotics & Pediatrics Congress 2019



Joint Event on
International Conference and Exhibition on
Probiotics, Nutrition and Functional Foods
&
17th World Congress on
Pediatrics and Nutrition
July 05-06, 2019 | Paris, France

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Choosing the appropriate probiotic for your patient based on strain and disease specificity

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Probiotics are living microbes, when used in adequate amounts, have a beneficial effect on the health of humans. As the popularity of different types of probiotics have become available, it has become increasingly difficult to know which types should be used for specific diseases.

Methods: A systematic review using standard databases (PubMed, Google Scholar) from 1977-December 2018 was conducted for randomized controlled trials (RCTs) of probiotics. Meta-analyses were done to determine if efficacy was strain-specific and/or disease-specific. A graded review was done to determine which probiotic strains had strong evidence for 19 different diseases.

Results: Results of the meta-analyses showed clear evidence that probiotics are both strain and disease specific, hence efficacy needs to be evaluated based on separate probiotic type and disease sub-groups. Of 816 RCTs screened, only 249 had at least 2 RCTs/probiotic type for specific diseases (prevention of 11 different diseases or treatment of 8

different diseases). Of the 22 different types of single-strain or multi-strain mixtures, 15 (68%) had strong evidence of efficacy. For example, of the 61 RCTs for the prevention of antibiotic-associated diarrhea, only four types of probiotics had strong-moderate evidence for efficacy (*S. boulardii* I-745, *L. casei* DN114001, *E. faecalis* SF-38 and a three-strain mixture (Bio-K+), while 4 other probiotic types had non-significant findings of efficacy. For the treatment of eight different diseases, the treatment of acute pediatric diarrhea had the most RCTs (n=61) and 7 different types of probiotics had strong evidence of efficacy, while one mixture had only moderate evidence. There was no 'universal' probiotic that was effective for every disease.

Conclusion: This analysis clearly demonstrated that not all probiotics are equally effective and the choice should be based on the evidence for the specific strain or strains for each specific disease.

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Interaction between probiotics and polyphenol-rich fruit

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Health benefits of dietary polyphenols are mediated in part by metabolites produced by intestinal microbiota. Considering that select probiotic bacteria strains metabolize polyphenols, we hypothesized that adding probiotics to a polyphenol-enriched diet would improve the health outcomes of polyphenol consumption. In separate studies, we found that dietary co-supplementation with probiotics and polyphenol-rich fruit reduced the health benefits

of either supplement alone. Polyphenol absorption, measured by urine hippuric acid, was not impaired by co-supplementation. Nor was probiotic viability reduced in the combined vs. probiotic diet. Identifying reasons for the interference requires further study of how probiotics affect resident microbiota communities and metabolite output.

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Attention deficit and hyperactivity disorder: Overview of diagnosis and treatment

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Attention Deficit and Hyperactivity disorder (ADHD) is a disorder that manifests in childhood. Diagnostic criteria for ADHD include symptoms of hyperactivity, impulsivity, and /or inattention that occur in more than one setting and affect function (academic, social, emotional...) It is usually discovered during the early school years when a child begins to have problems paying attention and/or being hyperactive. The causes of ADHD isn't known but researchers have found several things that may lead to it .This includes hereditary, chemical

imbalance, Brain Changes, Substance abuse during pregnancy. Symptoms are grouped in three categories: Inattention, Hyperactivity, impulsivity. The treatment strategy for children varies according to age. Treatment is based on behavioral Therapy, Stimulant medication. In this presentation, we will discuss how to recognize ADHD and the current medications or therapies for this condition along the latest updates.

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Development of a potential functional biscuit using cassava (*Manihot esculenta*) and inulin fermented with *Lactobacillus paracasei*

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Cassava (*Manihot esculenta*) is a cultivar which has been used previously for the development of baked products numerous times. Cassava tubers have been reported to contain 60% water, 38% carbohydrates and the 2% left divided into ash, lipids, proteins and crude fiber. This cultivar also have the special characteristic of lacking gluten, allowing celiac patients to consume the different kinds of products developed from this cultivar. Inulin is a fructooligosaccharide considered a prebiotic and dietary fiber which enhances the development of probiotic bacteria in human's gut and promote healthy bowel's movement. In the present work, a formulation was developed, and using it as a control, fats were substituted by inulin in 5 different levels. On par, flour fermentation was done using *Lactobacillus paracasei* in 5 different fermentation times. Through rheology assays and based on the storage modulus, mainly, the most appropriate were selected for the development of a prototype and its sensory evaluation. In inulin's substitution at 25% the

storage modulus showed a value of $193,987 \pm 74,130$ Pa, lower in comparison with control and the other treatments. There was no considerable difference in the nutritional content of the biscuits. Regarding the fermentation, storage modulus lowered as the fermentation time increased, at 4 h a value of $92,348.89 \pm 18,146$ Pa was obtained, considerably lower compared with the control. This treatment also showed an improvement in the nutritional balance by lowering the percentage of carbohydrates to $29.4 \pm 7.27\%$. The previously mentioned treatments were chosen to be used in the development of a prototype by combining them and obtaining a storage modulus of $230,045 \pm 40,301$ Pa. Nutritionally, the prototype is high in carbohydrates reaching a composition of $55.6 \pm 1.61\%$. A potentially functional baked product was developed. The product had a good sensorial acceptance, corresponding to the parameter of "I do not like nor dislike" in flavor.

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Prebiotic lactitol effects on gut microbiome in constipated old people

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Trillions of bacteria -ten microbial cells for every cell of our body-form a “metaorganism or metagenome” living inside the gut(the 40%-55% of solid stool matter) that influence many local and general vital functions like cancer, aging process and related diseases. Microbial metabolite choline is involved in colon cancer, nitric oxide affects host longevity, short chain fatty acids (SCFAs) are beneficial in constipation. We studied the action of disaccharide lactitol compared to polyethylene glycol 3350 (PEG) on fecal content of bacteria, short chain fatty acid (SCFAs) and enzymes in old persones with constipation. Subjects aging >60 years suffering from chronic idiopathic constipation, defined as <3 spontaneous bowel movements per week, received 20g of lactitol or 15g of PEG a day for four weeks. The study was an open, randomized, parallel groups, third party (laboratory) blinded trial. Compliance and clinical effects were similar and all subjects with both treatments experienced an increased in the number and a decreased in the consistency of stool per day. Total fecalSCFAs, and particularly acetate and butyrate concentrations increased with lactitol and fell with PEG

($p < 0.05$). In lactitol group Bifidobacteria and Lactobacilli counts correlate with total SCFAs ($r = 0.48, p < 0.05$), acetate ($r = 0.50, p < 0.05$), propionate ($r = 0.44, p < 0.05$), and respectively with total SCFAs ($r = 0.44, p < 0.05$), butyrate ($r = 0.46, p < 0.05$), isobutyrate ($r = 0.69, p < 0.001$), valerate ($r = 0.53, p < 0.001$) and isovalerate ($r = 0.58, p < 0.005$). In PEG group the the correlations resulted significant between Eneobacteria and total SCFAs, acetate, propionate, butyrate, isobutyrate, valerate, isovalerate. The β -galactosidase was significantly increased by lactitol and decreased by PEG ($p < 0.05$). B-glucuronidase fell with both treatments ($p < 0.05$). pH from baseline value of 7.5 ± 0.7 turned toward acidity (6.6 ± 0.8) with lactitol and from 7.4 ± 0.7 toward alkalinity (7.7 ± 0.5) with PEG. In conclusion: lactitol and PEG both normalize the frequency of evacuations but with different mechanisms. Lactitol works as a prebiotic increasing stool SCFAs concentration, particularly butyrate and acetate, while PEG, as pure osmotic laxative, negatively interferes with colonic fermentation reducing SCFAs production

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Informal Developmental Assessment

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Informal Developmental assessment is a process where you gather information, observe, play and interact with the child and his caregiver in a non-standardized way. Through this assessment you can assess all the major developmental domains including (gross and fine motor skills, speech and language, social, play as well as academic skills. It a major and important element of pediatric assessment at any stage/visit. Informal Developmental assessment can be performed by family physician, pediatrician and childhood educator. it

has advantages of being simple, flexible, cheap and it gives you a valuable information so you can start providing the support and services to your client as well as to support your decision to refer or to perform further assessment including standardized ones. During this talk we will be able to choose our tool and learn how to perform an informal Developmental assessment in an informative and organized way.

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Identification of potential probiotic candidates to prevent oral candidiasis

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Studies focused on antifungal activity of *Lactobacillus* may contribute to the discovery of new therapeutic strategies for *Candida* infections. In the previous studies of our research group, we isolated and identified *Lactobacillus* spp. from the oral cavity of caries-free subjects to seek for strains with antifungal activity against *Candida albicans*. Firstly, the effects of 30 clinical isolates of *Lactobacillus* were evaluated on the number of viable cells of *C. albicans* in biofilms and on hyphae formation by in vitro assays. The results demonstrated that *L. paracasei* 28.4, *L. rhamnosus* 5.2 and *L. fermentum* 20.4 were the strains with the highest antimicrobial activity on *C. albicans*. These strains were able to reduce the biofilms by decreasing the total biomass, changing the morphological

architecture and downregulating the gene expression of *C. albicans* (ALS3, HWP1, EFG1 and CPH1). In the in vivo study, the injection of *L. paracasei* 28.4 into the *Galleria mellonella* increased the survival rate, the number of hemocytes and the expression of antifungal peptides, thus reducing the CFU of *C. albicans*. In *Caenorhabditis elegans*, *L. paracasei* 28.4 was also able to increase the survival of worms infected with *C. albicans* and reduce the filamentation. We conclude that *L. fermentum* 20.4, *L. paracasei* 28.4 and *L. rhamnosus* 5.2 have potential to be used as probiotics in the oral cavity to control *Candida* infections.

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Hyperbaric treatment increases bioactive compounds in cashew apple

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Fruits and vegetables are an important part of healthy eating habits and consumers are demanding more high-quality, fresh fruits and vegetables that are free from chemical preservatives. Good or improved nutritional properties of fruits and vegetables has motivated the food industry to improve existing technologies, and has led to many studies on novel technologies. Hyperbaric treatment consists in exposing a fruit or vegetable to pressure ranging from 100 to 1000 kPa. In these conditions, the commodity is under an O₂ partial pressure 1 to 10 times greater than in the normal atmosphere. This type of treatment has been found to have a positive effect on the quality of some commodities and has shown promising results in extending storage life of some fresh fruit and vegetables. It has been shown to reduce respiration rate, ethylene production and the ripening process as well as probably extend the synthesis of certain biochemicals of

fruits. Moreover, researches showed that lycopene content was enhanced by hyperbaric treatment at the end of ripening period. The above findings imply that hyperbaric treatment may not only extend shelf-life and preserve produce quality but also induce a secondary metabolic response during the treatment, thus possibly inducing disease resistance and enhancing synthesis of certain bioactive compounds in the produce. The aim of our study was to evaluate the effect of the application of hyperbaric pressure at 100 (control), 200, 400, 600 and 800 kPa for 1, 2 or 4 d, followed by 2 d under ambient conditions, on the production of bioactive compounds of the cashew apple (*Anacardium occidentale* L.). The results show that application of hyperbaric pressure up to 800 kPa increase the carotenoids, anthocyanins and flavonoids contents of cashew apple.

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Two-dimensional cultured intestinal stem-cell derived organoids as a model to test nutritional compounds for intestinal health

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We developed a two-dimensional (2D) intestinal stem cell-derived organoid model with both crypt and differentiated villus cells (enterocytes, goblet cells and enteroendocrine cells) to study safety and efficacy of compounds. Organoids were grown from duodenal, jejunal and ileal tissue. We show that these 2D organoid cultures maintain location-specific gene expression and responses, e.g. that the artificial sweetener rebaudioside A (derived from Stevia) stimulates production of GLP1 specifically by ileal enteroendocrine cells. Furthermore, we grow 2D

intestinal organoid cultures in transwell format to confluent monolayers with build-up of electrical resistance, low FD4 leakage and responsiveness to cytokines. Our data indicates that our 2D intestinal organoid model allows studying effects of compounds beyond possibilities with standard epithelial cell lines. We are currently exploring this culture method to investigate effects of other nutritional compounds on the intestinal uptake and mucin production.

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What are the realistic ways of application of LAB as a safe biopreservation tools in food fermentation processes?

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In last few decades' research for an appropriate starter culture combining different beneficial properties from technological, biopreservation, bacteriocin production to the probiotic's characteristics been explored by for different LAB cultures by several research groups. The challenge of combining different disable characteristics in a same starter culture was faced. Different approaches were applied, and results were a development of innovative applications of LAB in biopreservation of fermented meat products. However, with the development of different branches of the life sciences and build of new knowledge in microbiology new challenges were faced. Traditional knowledge on safety of LAB was not any more sufficient to certificate safe application of used for centuries LAB starter cultures. Besides all beneficial properties studied for various LAB, a special attention needs to be pay on the safety of LAB: the possible presence of virulence factors, production of biogenic amines and

antibiotic resistance. This virulence determinants have been well detected and studied in Enterococci and Streptococci, however, in last few years report on presence of virulence factors in otherwise GRAS Lactobacilli have been showing the potential upcoming problems. Horizontal gene transfer of virulence factors between pathogenic and LAB, including probiotics is a highly possible scenario in case of uncontrolled application of probiotics.

In this overview we focus of application of beneficial LAB in production of fermented food products, however, we point attention of some challenges that this process can face. How this can be solved, what are the realistic way of application of LAB as a useful tool of biopreservation and what are the limitation? Where is the limit between reality and fiction? Are LAB safe for industrial application and what are limitations?

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