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## **International Journal of Probiotics & Prebiotics 8 (1): 1-4.**

### **1-4 BACTERIA AND INTESTINAL HEALTH IN ADULT AND PEDIATRIC POPULATION: MOVING FROM THE FIELD OF ALTERNATIVE MEDICINE TO EVIDENCE-BASED TREATMENT**

Enzo Masci

**ABSTRACT:** *This editorial is an overview of a conference (Bacteria and Intestinal Health: From Infants to Adults) held in Milan Italy (February 11, 2012) to address issues in recommendations for the use of probiotics in clinical practice. Experts in pediatrics, gastroenterology and other internal medicine disciplines including probiotics researchers attended the conference. The general consensus of the conference attendees can be summarized as follows. Evidence from high-quality randomized controlled trials now exists for the therapeutic use of probiotics in infectious diarrhea in children, recurrent C. difficile-induced infections and post-operatives pouchitis. Additional evidence is accumulating for the use of probiotics in other gastrointestinal disorders, IBS and IBD. Unfortunately the current literature is a mixture of studies on different probiotic bacteria, at different dose, not all of which will have the same therapeutic effect.*

## **International Journal of Probiotics & Prebiotics 8 (1): 5-10.**

### **5-10 GUT MICROBIOTA AND IRRITABLE BOWEL SYNDROME**

D. Compare, A. Rocco, A. Cianflone, O.M. Nardone, M. Sanduzzi-Zamparelli, D. Angrisani and G. Nardone

**ABSTRACT:** *Irritable bowel syndrome (IBS) is the commonest functional gastrointestinal disorder, affecting between 10% and 20% of the adult population worldwide. Recently, IBS research has focused on organic components of causative factors such as gut microbiota that in turn may trigger at mucosal level low-grade inflammation and immune activation. To date, four main lines of reasoning support the role of gut microbiota in the pathogenesis of IBS: 1) IBS develops in up to 30% of individuals recovering from acute gastroenteritis “post-infective IBS”; 2) small intestinal bacterial overgrowth (SIBO) is characterized by symptoms like IBS; 3) quantitative and qualitative alterations in gut microbiota “dysbiosis” have been reported in subjects with IBS; 4) IBS symptoms can be improved by treatments (antibiotics, probiotics, prebiotics) that target the microbiota. These arguments open the way to new therapeutic options to treat patients with IBS by the administration of antibiotics, probiotics and perhaps prebiotics. Antibiotic treatment results in significant improvement rates in IBS symptoms; however, side or systemic effects, drug resistance and cost limit the chronic use. Many studies report a positive effect of probiotics, however, at present randomized placebo-controlled trials taking into account well-defined and measurable endpoints and a long follow-up should be planned.*

## **International Journal of Probiotics & Prebiotics 8 (1): 11-14.**

### **11-14 MANAGING ALLERGY: ROLE OF PROBIOTICS**

E. D'Auria , S. Palazzo, P. Poli and E. Riva

**ABSTRACT:** *Over the past few decades, there has been a dramatic increase in the prevalence of atopic diseases, primarily in the western, industrialized countries. The 'hygiene hypothesis' postulates that this rise has been caused by reduced exposure to microbial stimuli in early life. However, this theory has been challenged by epidemiological data suggesting possible roles for other environmental factors, including diet in the epidemics of atopic diseases. At the same time, it is becoming clearer that gut microbiota may be crucial in the regulation of immune responses. A lot of factors may affect the microbiota composition and lead to immune dysregulation and inflammation or immune regulation and tolerance. In this article we review the recent literature that show possible value of the probiotics in the treatment and prevention of atopic diseases.*

## **International Journal of Probiotics & Prebiotics 8 (1): 15-18.**

### **15-18 PROBIOTIC-THERAPY IN ONCOLOGY**

Daris Ferrari, Francesca Broglio, Francesca Crepaldi, Martina Violati, Lorenzo Dottorini, Carla Codecà, Nicolò Battisti, Veronica Bordin, Andrea Luciani and Paolo Foa

**ABSTRACT:** *probiotics and prebiotics can exert several beneficial effects in the gastrointestinal tract, such as anti-tumor activity; many studies have been conducted to analyze this activity and its mechanisms. However, their mode of action is not yet well understood. Recent data show the relationship between colon cancer and intestinal bacterial flora. We reviewed the evidence from different studies in order to prove these beneficial effects on the host.*

## **International Journal of Probiotics & Prebiotics 8 (1): 19-24.**

### **19-24 AN UPDATE ON PROBIOTIC THERAPY FOR CHRONIC INFLAMMATORY BOWEL DISEASES IN ADULTS**

G. de Nucci, L. Pastorelli, G.E. Tontini, L. Spina and M. Vecchi

**ABSTRACT:** *Inflammatory bowel diseases (IBD) pathogenesis is due to complex interactions between patient's genotype, immune system and commensal gut flora. The immunological basis of IBD is mucosal (Ulcerative colitis) and transmural (Crohn disease) inflammation mediated primarily by T-helper lymphocytes and then by release of different inflammatory cytokines. Increasing evidences derive from the fact that the inflammation responsible for the IBD seems to be more intense in the gut regions characterized by the highest bacterial concentrations. The most intriguing hypothesis holds that IBD are caused by an altered equilibrium between body's immune response to and immunotolerance of the intestinal commensal flora. The gut flora carries out important metabolic activities and regulatory*

*effects on the mucosal immune system and its homeostasis. The flora of IBD patients shows significant qualitative and quantitative changes with potential effects on homeostatic mechanisms in the gut epithelium. These data have resulted in attempts to treat IBD by modifying the gut flora with antibiotics, prebiotics and probiotics. Today, there is a much larger body of evidence on the role of probiotics in the treatment of IBD. However, few randomized controlled trials have been conducted; many of these with significant biases so that the issue requires necessary further investigation.*

### **International Journal of Probiotics & Prebiotics 8 (1): 25-28.**

#### **25-28 MICROBIOTA AND INFANTILE COLIC: WHAT'S NEW?**

E. Verduci, C. Arrizza, E. Riva and M. Giovannini

**ABSTRACT:** *Alterations of gut microbiota are implicated in the genesis of infant colic. Infants with colic are most often colonized by Gram-negative anaerobic bacteria and less frequently by bifidobacteria and lactobacilli. These could lead to a deregulation of intestinal motor function and an increase in gas production. Moreover infant colic previously believed to be nonorganic in nature, have evidence of intestinal neutrophilic infiltration. Some studies describe the improvement of colic symptoms by supplementation of Lactobacillus reuteri. However, although the results of supplementation with peculiar lactobacillus for the treatment of colic symptoms appear encouraging, are needed more studies to achieve accurate guidelines for their use, also concerning the way of administration (e.g. in infant formula).*

### **International Journal of Probiotics & Prebiotics 8 (1): 29-32.**

#### **29-32 PROBIOTICS AND PREVENTION OF ANTIBIOTIC ASSOCIATED DIARRHOEA IN CHILDREN**

F. Salvini

**ABSTRACT:** *Diarrhoea, as a common side effect of antibiotic administration, causes increased treatment costs and extended length of stay in acute healthcare facilities. Children are estimated to use three times more antibiotics than adults; moreover, the antibiotics prescribed to treat children are often cause of antibiotic associated diarrhoea (AAD). One potential strategy to prevent this side effect is the concurrent use of specific probiotic strains or yeast. Probiotic may prevent AAD rebalancing the gut microflora. This review summarizes the current knowledge on probiotic use in the prevention of AAD in children.*

### **International Journal of Probiotics & Prebiotics 8 (1): 33-40.**

#### **33-40 DIVERTICULAR DISEASE OF THE COLON: ANTIBIOTICS OR PROBIOTICS?**

Giovanni Maconi, Michela Monteleone, Cristina Bezzio, Federica Furfaro and Roberto de Franchis

**ABSTRACT:** *Antibiotics and probiotics share a common rationale in the treatment of diverticular disease of the colon. They can restore the composition of the colonic microflora, which is involved in the mucosal inflammation and indirectly related functional changes of the colon such as visceral hypersensitivity and smooth muscle hypertrophy. However, to date,*

*reliable controlled therapeutic trials and solid scientific evidence about the use of antibiotics and probiotics in diverticular disease of the colon are still lacking. The available data show that both antibiotics and probiotics can improve symptoms and maintain symptom-free remission up to one year in most patients. On the contrary, the use of antibiotics in preventing acute diverticulitis seems to be limited, and probably it should be restricted to patients with previous complication of diverticular disease, such as perforation or bleeding. Unfortunately, data on the usefulness of probiotics in the long-term prevention of diverticulitis are still lacking, so far.*

## **International Journal of Probiotics & Prebiotics 8 (1): 41-44.**

### **41-44 PROBIOTICS IN THE PREVENTION OF ANTIBIOTIC-ASSOCIATED DIARRHEA IN ADULTS**

Elisa Suardi, Fulvio Crippa and Antonella d'Arminio Monforte

**ABSTRACT:** *Antibiotic-associated diarrhea (AAD) is defined as an otherwise unexplained diarrhea that occurs in association with the administration of antibiotics. Its incidence varies among antibacterial agents from 5 to 10 % with ampicillin, 10 to 25 % with amoxicillin-clavulanate, 15 to 20 % with cefixime, 2 to 5 % with other cephalosporins, fluoroquinolones, azithromycin, clarithromycin, erythromycin and tetracycline. Clostridium difficile associated-diarrhea (CDAD) is a severe side effect of antibiotic therapy, with epidemics documented in U.S.A., Europe and Canada. Recurrent Clostridium associated-diarrhea occurs in 10-20% of all CDAD and can be difficult to treat, but there is evidence for probiotics usefulness as a component of therapeutic strategy. The most studied probiotics include Saccharomyces boulardii and Lactobacillus spp. Antibiotics have multiple effects on the pathogenesis of AAD including some that are independent from their antimicrobial activity. Specifically, erythromycin acts as an agonist of the motilin receptor accelerating the rate of gastroenteric motility; clavulanate in amoxicillin-clavulanate appears to stimulate small-bowel motility and penicillins may rarely cause segmental colitis. Furthermore antibiotics may substantially reduce the concentration of fecal anaerobes and as a consequence the metabolism of carbohydrates may decrease leading to osmotic diarrhea. Probiotics promote an increasing of free acids in the gut lowering luminal pH, which suppresses the growth of pathogenic flora. Probiotics also decrease the colonization of pathogenic organisms in the gut by secreting hydrogen peroxide and organic acids that are locally toxic to pathogenic bacteria and may competitively block microbial adhesion to the gut epithelium. Moreover, certain probiotic strains may have immunomodulating effects such as increase cytokine activity and stimulate lymphocyte and macrophage phagocytosis in the intestine. Five meta-analyses on probiotics usefulness for the prevention of AAD have been performed. The largest meta-analysis to date analyzes 25 randomized controlled trials on probiotics including 2810 subjects has showed an overall reduction in the risk of AAD when probiotics were co-administered with antibiotics. Probiotics are generally safe but should be used with caution in categories of patients with deficiency of the immune system or with disruption of the integrity of the intestinal mucosa. Caution should be warranted also in presence of a central venous catheter, since some systemic infections sustained by probiotics have been reported in this setting. In spite of some evidence consensus statements favoring the use of probiotics in the prevention of AAD is lacking, due to the difficulties in analyzing the available studies. The differences of sample sizes with heterogeneous populations, the differences in the given dose of probiotics agents, the differences in the amounts of viable organisms administered represent the main factors*

*impacting the correct interpretation of the promising results found in these studies. Moreover, study designs are not homogeneous as well as endpoints and objectives that do not include assessments of possible adverse events. In conclusion, albeit some promising results on the efficacy of probiotics in the prevention of AAD and C. difficile associated diarrhea, there are no evidence-based guidelines regarding probiotics for this use. Adequately powered, double blind randomized controlled trials are needed to assess the efficacy of specific probiotic strains.*

## **International Journal of Probiotics & Prebiotics 8 (1): 45-48.**

### **45-48 MICROBIOTA AND RECURRENT ABDOMINAL PAIN IN CHILDREN**

Ghisleni Diana, Di Dio Francesco and Fedeli Sara Federica

**ABSTRACT:** *Chronic abdominal pain (CAP) or recurrent abdominal pain (RAP) is a multifactorial condition which may be the predominant clinical manifestation of a large number of organic disorders, rarely associated with organic disease. The prevalence in western countries ranges between 0.3 and 19%. The onset age is between 4 and 6 years and early adolescence, with a slight female predominance. According to Rome Criteria, symptom-based diagnostic criteria, nonorganic RAP can be divided into 5 functional gastrointestinal disorders (FGIDs): functional abdominal pain (FAP), functional abdominal pain syndrome (FAPS), irritable bowel syndrome (IBS), functional dyspepsia (FD) and abdominal migraine. A successful treatment of FGIDs in children may include modifications of physical and psychological stress factors, medication and dietary manipulation. Commensal intestinal bacteria have a play in gastrointestinal tract homeostasis. Alterations in microbiota have been implicated in dismotility, visceral hypersensitivity, abnormal colonic fermentation and immunological activation with several mechanisms of action. Probiotics offer considerable potential in treatment or prevention of FGIDs, particularly in irritable bowel syndrome. Further efforts are necessary to better understand the involved mechanisms, the most indicated microorganism for each FGIDs, the amount to administer and the treatment duration.*