T1821

Fructose Malabsorption From Infancy to Adulthood in Patients With Gastrointestinal Symptoms

Hilary F. Jones, Esther Burt, Monica Metcalfe, Kate Dowling, Geoff Davidson, Doug A. Brooks, Ross N. Butler

Background: Fructose malabsorption can produce symptoms such as chronic diarrhoea and abdominal pain, especially in children. With consumption of fruit juices by infants and addition of fructose to foods as a sweetener, fructose malabsorption is a possible cause of symptoms from infancy to adulthood. We aimed to retrospectively review breath test results to define the percentage of fructose malabsorption in paediatric and adult patients, and to compare this with lactose malabsorption. Methods: Patients were referred to a gastroenterology breath testing clinic (2003-2008) for fructose and lactose breath hydrogen testing (BHT) to investigate carbohydrate malabsorption as a cause of gastrointestinal symptoms. Patients received either 0.5 g/kg body weight of fructose to a maximum dose of 10g, or 2g/kg of lactose to a maximum of 20 g, dissolved in water, and were tested over 2.5 hours. Results: Logistic regression demonstrated that patients' age had a significant effect ($P<0.001$) on the fructose breath test results (n=1093). In children 0.1-9 years, 64.5% of patients tested positive, which was significantly higher ($P<0.001$, n=634) than for patients 10-79 years old. In patients 10-79 years old there was no significant difference by age bracket (P=0.1, n=459) and 29.8% tested positive. In the paediatric patients (≤15 years old, n=760), the odds of testing positive for fructose malabsorption decreased by a factor of 0.82 (95% CI 0.79-0.86) per year. In contrast, 39.3% of lactose BHTs were positive (n=3073), with no significant relationship between age and test result (P=0.115, 0.1-89 years old). Conclusions: The majority of infants with gastrointestinal symptoms exhibited fructose malabsorption, and the capacity to absorb fructose increased with patient age up to 10 years old. These findings suggest a lower threshold for fructose absorption in younger children, especially in those presenting with gastrointestinal symptoms, and this has significant implications for the interpretation of fructose BHT and for dietary consumption of fructose in those infants. Percent positive for fructose malabsorption by age groups:

Age (years)	n	Percent Positive	95% Confidence Interval
<1	68	88.2%	(80.6 - 95.9)
1-5	440	66.6%	(62.2 - 71.0)
6-10	156	40.4%	(33.3 - 48.7)
11-15	96	27.1%	(18.2 - 36.0)
>15	333	30.9%	(26.0 - 35.9)

T1822

Prevalence of Irritable Bowel Syndrome in the Greek General Population

Nikos Viazis, George Papatheodoridis, Jiannis Vlachogiannakos, Costas Markoglou, Panagiota Vasianopoulou, Eleni Vienna, Helen Keimali, Dimitrios G. Karamanolis

Background. The prevalence of Irritable Bowel Syndrome (IBS) has been reported to range between 12-20% in European countries, but no data are available for Greece. We performed a community survey in order to document prevalence, demographics, clinical features and management of IBS in the Greek population. Methods. The survey was performed utilizing well established marketing research techniques. In the first stage, prevalence of IBS, as defined by the Rome III criteria, in the general community was collected. In the second stage, personal interviews were done with subjects suffering from IBS to further understand the natural history, profile of complaints, actual mode of presentation of individual episodes, role of the physician and the role of medication in dealing with symptoms. Data were analyzed using descriptive statistics and logistic regression. Logistic regression was carried out on the dataset and Odds Ratios (OR) and their 95% confidence interval (CI) were calculated where appropriate. Results. The study sample consisted of 1800 participants (51% females), 15-64 years old, living in large and small urban centers. Symptoms of IBS were reported by 13% of the participants. Women suffered more frequently than men (19% versus 8%; OR:2.70, 95%CI: 1.96-2.62, p<0.0001), as well as participants over 45 compared to those 18-44 years old (19% versus 11%, OR:1.90, 95%CI: 1.42-2.62, p<0.0001). The main symptom reported was abdominal cramping and pain (100%) and this was accompanied by bloating and/or fullness (70%). Diarrhea and constipation was reported by 50% and 35% respectively. IBS symptoms were an issue of primary importance. Medical advice was asked by 40% of sufferers. Females and sufferers aged 35-44 years old, as well as those aged 54-64 years old were more likely to seek medical advice for their symptoms. The main reason for seeking medical advice was concern about persistent and recurring pain symptoms. Patients usually visited general practitioners/internists (60%) and/or gastroenterologists (43%). Patients reported using a drug for symptomatic relief in 62% of the episodes. Drug use for symptomatic relief was more common amongst young sufferers aged 25-34 years old (83% of abdominal pain suffering instances). The drug most commonly by 23 % used was hyoscine (Buscopan). Conclusions. Approximately one out of 8 individuals (13%) of the Greek general population suffers from symptoms of irritable bowel syndrome. Such symptoms are more frequent in females and individuals older than 45 years and often make sufferers to seek medical advice. Drugs for symptomatic relief are used in the majority of episodes of abdominal pain.

T1823

Novel Metabolomic Evidence of Probiotic Effect in Patients With Irritable Bowel Syndrome

Kyoung-Sup Hong, Young-Shick Hong, Park M. Hwa, Young-Tae Ahn, Jung-Hee Lee, Chul-Sung Huh, Jaekyung Lee, In Kyoung Kim, Geum-Sook Hwang, Joo Sung Kim

BACKGROUND/AIM: Probiotics play a role in human health mainly through modulation of gut microbiota, which is important for improving symptoms of patients with irritable bowel syndrome (IBS). We, for the first time, performed a randomized clinical study to investigate global metabolic effect of probiotics through metabolomic analysis in patients with IBS. METHODS: Seventy four IBS patients meeting Rome III criteria were randomly assigned to receive probiotics or placebo. Probiotic fermented milk was administered three times daily for 8 weeks. Clinical outcome variables were symptom scores consisting of abdominal pain, flatulence, defecation discomfort and sum of symptom scores. 1H NMR spectra were acquired from serum and fecal samples of all participants. Pattern recognition methods such as principal component analysis (PCA) and orthogonal projections to latent structures discriminant analysis (OPLS-DA) were used to differentiate between before and after treatment, then we compared the results with those from healthy volunteers without IBS. RESULTS: The intention-to-treat analysis showed significant improvements of defecation discomfort and sum of scores in probiotics group. After administration of probiotics, serum glucose (P < 0.05) and tyrosine (P < 0.05) levels decreased, and serum lactate level (P < 0.0001) increased. When compared with results from healthy volunteers, increased levels in serum glucose and tyrosine were associated with IBS and corrected after administration of probiotics. CONCLUSIONS: Selected probiotics were effective on symptoms of IBS patients. Metabolomic analysis showed probiotics reduced glucose and tyrosine levels in IBS patients, which suggests improvement of host glycolysis and energy metabolism by probiotics.

T1824

Sub Clinical Intestinal Mucosal Inflammation in Diarrhea Predominant Irritable Bowel Syndrome (IBS) in a Tropical Setting

Arjuna P. De Silva, Aresha Manamperi, Shivanthi J. Hewavisenthi, Madurangi P. Ariyasinghe, A. S. Dassanayake, Derek P. Jewell, H. J. de Silva

Background: There is evidence for potential roles for gut flora and the host immune response in the pathophysiology of IBS, and especially, for low grade colonic mucosal inflammation in the pathophysiology of post-infectious IBS. Aim: To investigate for evidence of sub-clinical intestinal mucosal inflammation in diarrhea- predominant IBS (IBS-D) in a tropical setting. Methods: In a prospective study over one year, we investigated 49 patients with IBS-D [median age 34 years (range 18-59; M:F 36:13], based on Rome III criteria. None had alarm symptoms: unintentional significant loss of weight, bleeding per rectum or malaena. None were on NSAIDS or proton pump inhibitors. All patients had normal ESR, CRP, TSH and stools reports. 14 individuals with a family history of colon cancer [median age 46.5 years (range 23-56); median 46.5, M:F 6:8] were selected as controls. Stools of patients and controls were tested for calprotectin. During colonoscopy, serial biopsies were obtained from the ileum, caecum, ascending, transverse and descending colon, and rectum. In addition to histology, tissue expression of IL-8 and IL-10 were assessed in biopsy specimens using semi-quantitative RT-PCR. Results: Colono-ileoscopy was macroscopically normal and faecal calprotectin was undetectable in cases and controls. Microscopic colitis not otherwise specified (MNOS) was seen in 10/49 cases and 1/14 controls (p=0.43, Fisher's Exact test). Histology was normal in others. A history suggestive of an episode of infectious diarrhoea (ID) was seen in 16/49 cases and 0/14 controls (p=0.013). There was no significant association between ID and the presence of MNOS. Tissue expression of IL-8 was significantly higher and IL-10 significantly lower in cases compared to controls (target/standard cDNA ratio, median (range) IL-8: 1.25 (0.75-2) Vs 0.85 (0.63-1.3), p<0.0001, Mann-Whitney U test; IL-10: 0.33 (0-0.63) Vs 0.55 (0.5-0.7), p<0.0001). There was a significant inverse correlation between IL-8 and IL-10 expression (Pearson Correlation, (-) 0.509; p<0.01). In patients with IBS-D, cytokine abnormalities were not significantly different in those with or without a history of ID or the presence or absence of MNOS. Conclusion: There is evidence for sub-clinical intestinal mucosal inflammation in patients with IBS-D in a tropical setting, whether or not a history of ID or MNOS was present or absent.

T1825

Autoimmune Degenerative Neuropathy in the Enteric Nervous System (ENS) in Functional Gastrointestinal Disorders (FGIDs)

Jackie D. Wood, Sumei Liu, Wei Ren, William E. Whitehead

Background and Aims: The irritable bowel syndrome (IBS) is an example of a functional disorder. We aimed to investigate the size of the IBS subset in which symptoms are associated with circulating anti-enteric neuronal antibodies. Methods: Serum samples were collected from 100 Rome II-IBS patients at the University of North Carolina (UNC). Assay procedures involved immunohistochemical localization of serum antibody binding to enteric neurons and Invitrogen ProtoArray® Human Protein Microarray assay for antigen response profiles for antibodies present in IBS serum. Immunostaining fluorescence intensity was scored as 0=no staining; 1=moderate staining; 2=intense staining of neurons in the myenteric plexus and averaged for scores entered by three blinded observers. Results: Of 100 samples, 60% was scored as 1, 19% as 2 and 21% as 0. Five of 22 controls showed strong immunostaining. The controls were patients, visiting the UNC FGID center, who claimed not to have any recurring GI symptoms of abdominal pain, constipation, diarrhea, or bloating. Antibody staining when present was seen in the nucleus and cytoplasm of the ENS neurons. Immunostaining in the neuronal nuclei predominated (62% of samples) relative to staining of the cytoplasm alone (8%) or staining of both nuclei and cytoplasm (9%). The predominance of nuclear staining was consistent with human protein microarray data. Protein microarray analysis, with sensitivity for 8,000 human proteins, detected antibody reactivity for only three autoantigens in serum containing anti-enteric neuronal antibodies and no antibody reactivity for the same autoantigens in serum samples that did not contain anti-enteric neuronal antibodies in our immunostaining assay. Antibody titers for a macromolecular