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Emerging Parasitic Infection Mimicking Functional Bowel Disease

Javed Yakoob

Aga Khan University, javed.yakoob@aku.edu

Wasim Jafri

Aga Khan University, wasim.jafri@aku.edu

Mohammad Asim Beg

Aga Khan University

Z Abbas

Aga Khan University, zaigham.abbas@aku.edu

Shagufta Naz,

Aga Khan University

See next page for additional authors

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Authors

javed Yakoob; Wasim Jafri; Mohammad Asim Beg; Z Abbas; shagufta Naz;; Muhammad Islam; A. B. Khalid; Rustam Khan; and Zubair Ahmad

complex containing both protein and RNA molecules (i.e., a ribonucleoprotein complex) and small nuclear ribonuclear polypeptide A were present in high titers in serum that contained anti-enteric neuronal antibodies in our neuronal assays. Our Invitrogen®/ProtoArray assay did not find these antibodies in serum in which our immunostaining assay found no anti-enteric neuronal antibodies. Moderate levels of anti-ro 52000 MW antibody were present also in IBS serum. Anti-ro 52000 is a known biomarker for Sjögren's syndrome. Conclusion: The gut does not work well when the enteric nervous system (ENS) is not working well. The gut does not work at all without the ENS. The results suggest that symptoms in an unexpectedly large subset of patients with a diagnosis of IBS, might result from a degenerative ENS neuropathy with anti-enteric antibodies serving as a biomarker.

T1826

Altered Migrating Motor Complex After Side-to-Side Ileal Bypass in Mouse Ileum: Physiologic Mechanism Underlying the Blind Loop Syndrome?

Suk-Bae Moon, Kyu Joo Park, Jung Sun Moon, Eun-Kyung Choe, In-Suk So, Sung-Eun Jung

Introduction: Considering that MMC is a key element in intestinal motility, alterations in the MMC may be responsible for blind loop syndrome, a well-known complication following side-to-side intestinal anastomosis. This study intended to investigate the physiological mechanism underlying blind loop syndrome, based on migrating motor complex (MMC) in mouse model. Materials and Methods: Ileal side-to-side bypass anastomosis was performed on female ICR mice. In partial bypass model, contents were allowed to enter both the bypassed segment and distally past the bypassed loop. In total bypass model, proximal portion of the bypass segment was doubly ligated, not allowing the contents to enter bypassed loop directly. After 2 weeks or 4 weeks of the operation, the ileum containing the bypass loop was harvested and MMCs were recorded at 4 different recording channels (2 at the bypassed segment, and proximal and distal to the bypassed loop) with conventional tension recordings in a organ bath continuously perfused with prewarmed (37.0±0.5°C) Krebs-Ringer buffer. Amplitude, duration, interval, propagation pattern, and area under the curve (AUC) of MMCs were measured and compared to the control. Results: In control intact mouse ileum (N=7), most MMCs propagated aborally (91.1%). After 2 weeks of partial bypass (N=4), the proportion of orally-propagating MMCs was significantly increased (p=.002) in the bypassed segment. Bidirectional MMCs were also observed (10%). After 4 weeks of partial bypass (N=4), the propagation direction did not change significantly (p=.422), as compared to that of 2 weeks after the bypass. Amplitude and AUC of the MMCs decreased significantly after 2 weeks of partial bypass; the decrease of the amplitude became more prominent at 4 weeks but the AUC showed no significant changes compared to that of 2 weeks. In total bypass model at 2 weeks (N=6), bypassed segment had independent MMCs not coordinated to the proximal segment. All of MMCs within the loop propagated aborally. After 4 weeks of total bypass (N=5), MMCs within the bypassed loop lost temporal relationship or completely disappeared. Amplitude and AUC of the MMCs decreased significantly in total bypass model, both at 2- and 4 weeks compared to the control state. Conclusions: Continuation of intact intestinal tract seems to be required to maintain the amplitude and AUC of the MMCs. Changes in the propagation direction of the MMCs and resultant stagnation of contents in the bypassed loop may be responsible for the development of blind loop syndrome in partial bypass. Since the direction of propagation of the MMCs was maintained in total bypass, blind loop syndrome may be prevented.

T1827

Neurogenic Bowel in Persons With Spinal Cord Injury: An Evaluation Using SmartPill® Technology

Robert E. Williams, Ravi R. Vinnakota, Rany Z. Farid, Nishant Dhungel, Marinella D. Galea, Truptesh H. Kothari, Ann M. Spungen, William Bauman, Mark A. Korsten

Background: Neurogenic bowel is common after spinal cord injury (SCI) and has been associated with multiple secondary conditions, including difficulty with evacuation, impaction, and incontinence. Neurogenic bowel appears to prolong colonic transit time (CTT), based on radiopaque marker studies. A relatively new device, the SmartPill®, is a small, wireless, ingestible capsule that offers the ability to assess temperature, pressure, pH, and transit time as it traverses the gastrointestinal (GI) tract. The capsule measures these parameters with an accuracy of +/- 1 degree C, +/- 5 mmHg, and +/- 0.5 pH units. CTT was determined in able-bodied subjects (AB) and those with SCI using the SmartPill® GI monitoring system. Methods: SCI-, and age-, and gender-matched AB control subjects were recruited. Following an 8 hour overnight fast, subjects consumed a standard test meal consisting of 120g EggBeaters® [equivalent to 2 large eggs (60 kcal)], 2 slices of white bread (120 kcal), and 30g strawberry jam (74 kcal). A pH calibrated SmartPill® capsule was ingested with 8 ounces of water. Subjects were provided with a portable data receiver and remained fasted for 6 hours following capsule ingestion, at which time they consumed 1 Ensure Plus® nutrition shake (350 kcal). Subjects remained fasted for an additional 2 hours, after which time they resumed their normal diets. Data was collected by the data receiver until the capsule was excreted. CTT was defined as the time elapsed between the second abrupt increase in pH (indicating entry to the cecum) and an abrupt decrease in temperature (indicating excretion). Results: Data are expressed as mean +/- SD. Ten subjects with paraplegia (PARA) (8 males, 2 females; age, 55 +/- 12 years; duration of injury, 16 +/- 14 years; level of injury, T4-L2), 6 subjects with tetraplegia (TETRA) (6 males; age, 44 +/- 21 years; duration of injury, 11 +/- 7 years; level of injury C4-C7), and 8 AB subjects (6 males, 2 females; age, 43 +/- 11 years) were recruited for study. CTT was significantly longer in PARA compared to the AB group (51.8 +/- 47.0 vs. 13.6 +/- 8.4 hours, p<0.05). The TETRA group trended to have a longer CTT compared to the AB group (p=0.09). Total colonic mean peak amplitude (MPA) was significantly lower in the PARA and TETRA groups compared to the AB group (16.7 +/- 6.0 and 12.2 +/- 5.5 vs. 25.5 +/- 6.5 mmHg, respectively, p<0.01). Conclusion: In agreement with previous marker studies, CTT was prolonged in PARA. MPA was reduced in both PARA and TETRA groups. These findings may result from decreased parasympathetic tone to the colon and may be responsible, in part, for the secondary consequences of neurogenic bowel.

T1828

Fructose and Lactose Intolerance: Association With Atopy and Extra-GI Symptoms

Clive H. Wilder-Smith, Andrea Materna

INTRODUCTION: Sugar intolerances are common in patients with functional bowel disorders (FBD), although the prevalence of sugar malabsorption is not dissimilar to that in healthy populations. The association of lactose and fructose intolerances with other food reactions, including allergies and pseudoallergies, as well as extra-gastrointestinal symptoms is unclear and would suggest additional disorders, such as increased intestinal permeability and immune activation. METHODS: We prospectively assessed the prevalence of fructose (50g) and lactose (50g) intolerance in 586 Caucasian secondary to tertiary care FBD patients (mean age: 42±16y, 431 females, Rome III criteria) with H2 and CH4 breath testing (5 hours) as well as atopy and extra-GI symptoms using detailed questionnaires (during testing and long-term). RESULTS: The prevalence of intolerance in these FBD patients was 76% for fructose and 56% for lactose. Respective times to peak symptoms were 110±63 and 134±123 minutes. The commonest non-GI symptoms during testing with fructose/lactose were tiredness (46%/72%), headache (34%/52%), diminished concentration (26%/40%), myalgia (14%/20%), arthralgia (14%/20%), rash (5%/9%) and cardiac arrhythmia (4%/5%). The long-term history in fructose/lactose intolerance revealed prevalences of eczema (26%/9%), allergic rhinitis (19%/5%), asthma (12%/8%), oral allergy syndrome (14%/2%), hayfever (15%/5%), arthralgia (22%/8%), myalgia (18%/7%), tiredness (46%/19%), depression (19%/6%), drug allergies (10%/5%), reactions to cosmetics (12%/4%), reactions to household cleaning agents (7%/2%) and a childhood history of atopy (19%/5%); ANOVA fructose versus lactose: p<0.01. Adverse reactions to foods other than fructose, lactose, other oligosaccharides and polyols (FODMAPS) were reported in 27% of fructose intolerant and 9% of lactose intolerant (p<0.01). CONCLUSIONS: Significant non-GI symptoms were provoked during sugar intolerance testing. Intolerant patients with FBD have a marked history of atopy and non-GI adverse reactions. The significantly increased long-term prevalence of atopy and non-GI symptoms in fructose intolerance suggests the involvement of increased intestinal permeability and/or immune activation requiring further study.

T1829

Effect of Traditional Japanese Medicine Daikenchuto (TJ-100) in Patients With Chronic Constipation

Akira Horiuchi, Yoshiko Nakayama

Objective: In Japan a traditional herbal medicine Daikenchuto (TJ-100) has been commonly used for uncomfortable abdominal symptoms in patients with irritable bowel syndrome and chronic constipation. This study was to compare the effect of a stimulant laxative alone and in combination with TJ-100 in improving stool frequency and in alleviating bloating and abdominal pain in patients with chronic constipation. Patients and methods: All subjects who were enrolled in this study fulfilled the following; 1) they were taking a stimulant laxative, 24-60 mg/day of sennosides for at least three months, 2) they had abdominal symptoms including bloating and abdominal pain, 3) without the laxatives, the bowel movements were less than 3 times per week, 4) colonoscopy was normal, and 5) they had no history of abdominal surgery. The study period was 12 weeks and consisted of 4 weeks (pretreatment phase) before the administration of TJ-100, 6 weeks (treatment phase) for the administration of TJ-100, and 2 weeks (washout period) after cessation of TJ-100. The dose of TJ-100 used in this study is either 7.5 g/day or 15 g/day. The bowel movement frequency and the dose of sennoside required were recorded. Both bloating and abdominal pain were evaluated using visual analogue scale score. Abdominal symptoms were evaluated on the Gastrointestinal Symptoms Rating Scale. The gas volume score was measured at 0 week and 6 week using the method described by Koide et al (Am J Gastroenterol 2000; 95:1735-41). Results: The addition of TJ-100 to sennoside resulted in significant improvement in bloating (P<0.01) and abdominal pain (P<0.05). Its effects for abdominal pain were dose-dependent. There was no significant change in frequency of bowel movements or the dose of sennoside used. The gas volume score was significantly decreased after the addition of TJ-100 (P<0.05). Conclusions: The addition of TJ-100 reduced bloating and abdominal pain in patients with chronic constipation receiving stimulant laxatives, possibly by decreasing the bowel gas volume.

T1830

Emerging Parasitic Infection Mimicking Functional Bowel Disease

Javed Yakoub, Wasim Jafri, Mohammad Asim Beg, Zaigham Abbas, Shagufia Naz, Muhammad Islam, Abdullah B. Khalid, Rustam Khan, Zubair Ahmad

Background: Irritable bowel syndrome (IBS) is a functional bowel disorder characterized by abdominal pain and changes in bowel habits. The common symptoms include lower abdominal pain and bloating with alteration of bowel habits that may be described as diarrhea (IBS-D). Microsporidial infections are important infection in immunocompromized patients. These parasites are easily detected by light microscopy when infections are heavy however, early infections without spores, or light infections with low numbers of spores, are easily missed. This study was designed to determine the prevalence of Microsporidial infection in patients with IBS-D and compare it with those with out IBS-D. Methodology: Three hundred and one patients with 202(67%) were males with a mean age of 41±15 years and range 15-83 years were enrolled from January 2007 - December 2009 at the gastroenterology outpatient clinic of the Aga Khan University Hospital, Karachi. Patients underwent history, physical and laboratory examination including stool microscopy with wet mount, Trichrome staining and polymerase chain reaction (PCR) for microsporidia. Stool DNA was extracted using Qiagen Stool DNA extraction kit. The primers used for PCR were previously described in literature. Rome III criteria was used to define patients with IBS-D and epigastric pain syndrome. Comparison between groups was assessed using the chi-squared test, Fischer's exact test or likelihood ratio whichever appropriate. All p-value less than 0.05 was considered statistical significant. Result: One hundred-forty (47%) were diagnosed as IBS-D, 138(46%) had epigastric pain syndrome and 23(7%) had hepatitis C (HCV)-related chronic liver

disease with hepatocellular carcinoma (HCC). Microsporidial infection was positive on wet preparation in 8(2.7%), in 11(3.7%) on Trichrome staining and in 13(4.3%) on PCR. Microsporidia was diagnosed with PCR in 8(61%) (p= 0.002) with IBS-D, 4(31%) with HCC and 1(8%) with functional dyspepsia. Conclusion: Microsporidial infection may be associated with IBS-D. PCR for microsporidia has a better yield than examination of a wet preparation or Trichrome staining

T1831

Do Caesarean Section and Birth Order in Twin Pairs Influence Development of IBS Later in Life

May-Bente Bengtson, Jennifer R. Harris, Morten H. Vatn

Background and aims: There is emerging evidence that previous gastrointestinal infection and persistent low-grade inflammation play an important role in the pathogenesis of at least a subset of patients with irritable bowel syndrome (IBS). We hypothesize that perinatal factors disturbing the gut colonization in newborn, might trigger an inflammatory response in the mucosa and thereby contribute to development of IBS later in life. Mode of delivery and birth order of twins within the pair might represent this group of perinatal factors. Earlier investigation of our population-based twin cohort has demonstrated that low birth weight increased the risk for development of IBS, with environmental factors in utero as the most relevant contributing factor. However, the analyses were not adjusted for possible perinatal confounders. Low birth weight is closely related to critical illness, perinatal infections and use of antibiotics, which all could influence the gut microflora of the newborn. In the present study we evaluated the association between IBS and perinatal factors including mode of delivery (caesarean versus vaginal) and birth order of twins within the pair. Methods: A postal questionnaire was sent in 1998 to 12700 Norwegian twins born between 1967 and 1979 who were identified from the Norwegian national birth registry, which was established in 1967. The questionnaire included a checklist of 31 illnesses and symptoms, including IBS. Results: In 321 twin pairs, at least one twin reported a positive history of IBS. Twenty four pairs were concordant, and 297 pairs were discordant for IBS. There was no link between caesarean section and IBS when tested by logistic regression in the full sample, adjusted for birth weight and gestational age (adjusted OR = 1.01, 95 % CI: 0.65, 1.55). The association between IBS and the first born (51.2 %) and the second born (48.8 %) twin in discordant twin pairs (285 pairs) was almost similar (OR = 0.91, 95 % CI: 0.65, 1.26). Conclusion: The risk for development of IBS was not influenced by mode of delivery and birth order in twin pairs, suggesting that gut colonization is not important for IBS.

T1832

Methanobrevibacter Smithii is Prominent in Stool of Subjects With Constipation Predominant IBS and Methane on Lactulose Breath Test

Gene Kim, Stacy Weitsman, Jim Y. Chou, Janet Yang, Laura J. Hwang, Kimberly Low, Christopher Chang, Mark Pimentel

Evidence supports the association between constipation and methane on breath testing. This association is more than casual since methane infusion in an animal model of transit results in a 70% slowing of intestinal transit. In a recent study of stool flora, Ruminococcus was noted to be prominent in C-IBS subjects (Kassinen, et al). Ruminococcus sp. are not methanogenic organisms but a known hydrogen donor to facilitate methane production by true methanogenic organisms. The most common methanogen in humans is Methanobrevibacter smithii. In this study, stool from subjects with C-IBS and methane on breath test are compared to hydrogen only IBS subjects for Ruminococcus and Methanobrevibacter. Methods: Consecutive Rome II IBS subjects presenting for lactulose breath testing were eligible for study. Using a questionnaire and breath test results, subjects with methane (>3ppm during 180 minutes of testing) and constipation predominant IBS were determined. The control group included subjects with IBS not positive for methane on breath testing. After completion of breath testing, subjects were asked to provide a fresh frozen stool sample. From each stool sample, bacterial DNA was extracted (Qiagen QIAamp). PCR with previously published primers specific for Methanobrevibacter smithii, Ruminococcus albus and Ruminococcus flavifaciens 16S rRNA were used to detect their presence in stool Results: After exclusion criteria were applied 9 subjects (8 female) with and 10 subjects (8 female) without methane completed the study. The average age was no different between groups. In the methane group the validated symptom C-D score was 5.1±3.8 compared to -0.11±3.6 for non-methane subjects (P<0.01) indicating the balance towards significant constipation in methane subjects. Bloating and abdominal pain were not different between groups. The mean methane area-under-the-curve for the first 120 minutes of breath test was 156±77ppm. On PCR only 1 patient (methane positive) had evidence of both R. albus and R. Flavifaciens. However, Methanobrevibacter smithii was strongly present in 5 of 9 (56%) methane producers and only weakly positive in 2 of 10 (20%) non-methane subjects. Among only methane producers, those positive for M. smithii had a greater area-under-the-curve for methane at 187±85ppm compared to methane subjects without M. smithii (118±53ppm) although not powered enough to be significant. Conclusions: Ruminococcus albus and flavifaciens appear to be uncommon in methane subjects with C-IBS. Methanobrevibacteri smithii appears important in these subjects although other methanogens must also be examined since 4 of 9 methane subjects had no detectable M. smithii.

T1833

Blastocystis hominis in Patients With Irritable Bowel Syndrome and Eradication With Nitazoxanide

William P. Stuppy

Purpose: *Blastocystis hominis* (BH) is a protozoan commonly found in the human digestive tract. Surveillance studies from the United States and Europe indicate 11-38% of the population may be infected with this organism. However, the pathogenicity of BH is controversial despite increasing evidence supporting the role of this protozoan in digestive disorders.

While some patients with BH may be asymptomatic, recent studies indicate a strong association between irritable bowel syndrome (IBS) and BH infection. There is no drug indicated for the treatment of BH, metronidazole has traditionally been used for treatment. Unfortunately drug resistance has become problematic with metronidazole therapy. Currently, the 2009 Sanford Guide to Antimicrobial Therapy recommends nitazoxanide as the primary treatment option for BH. Nitazoxanide is indicated for the treatment of *Cryptosporidium parvum* and *Giardia lamblia* in adults and in children and has demonstrated activity against BH in both clinical and *In Vitro* studies. This abstract reports on the use of nitazoxanide for the eradication of BH in patients with IBS. **Methods:** Patients with a diagnosis of IBS by ROME II/III criteria had their stool examined via microscopy (Diagnos-Techs, Inc., Kent, WA) for the presence of BH as part of their serial workup. Those with positive stools were then treated with nitazoxanide 1 g twice daily for 14 days. Upon follow-up examination patients had their stools rechecked for the presence of BH and they were re-evaluated for their IBS symptoms. Microbiologic cure was defined as those with negative stools for BH after therapy. Clinical response was defined as resolution of IBS related symptoms. **Results:** Overall 22 patients (10 males and 12 females) with IBS had stool studies positive for BH. The mean age of the population was 53 years. A microbiologic cure was achieved in 82% (18/22) of the patients and a clinical cure in 86% (19/22) of the patients. There was an excellent correlation between the eradication of BH and the resolution of IBS symptoms, 94% (17/18). Nitazoxanide was well tolerated with most patients reporting yellowing of the urine, and a few complaining of gastrointestinal discomfort during therapy which had resolved at follow-up. **Conclusion:** In this study, nitazoxanide was effective for the treatment of *Blastocystis hominis* infection. The complete pathogenic role of BH remains unclear, however it should be considered a potential pathogen in symptomatic patients. Double-blind placebo controlled studies are warranted to determine the role of *Blastocystis hominis* in patients with IBS.

T1834

The Expression of the Tight Junction Proteins, Claudin-1, Occludin and ZO-1 is Reduced in the Colonic Mucosa of Patients With Irritable Bowel Syndrome

Nathalie Bertiaux-Vandaele, Beutheu-Youmba Stéphanie, Belmonte-Zalar Liliana, Stephane Leclaire, Michel Antonietti, Guillaume Gourcerol, Leroi Anne Marie, Pierre M. Déchelotte, Philippe R. Ducrotte, Moïse Coëffier

Introduction: Recent studies have suggested that an increased intestinal paracellular permeability is a key physiopathological factor in the irritable bowel syndrome (IBS). This increased permeability could be due to alterations of tight junction proteins. The aim of this prospective study was to compare in the colonic mucosa the expression of the tight junction proteins in patients between IBS patients and healthy controls. Materials and methods: 23 IBS patients (21 women, 2 men, mean age: 47,69 years) fulfilling the Rome III criteria and 20 controls (12 women, 8 men, mean age: 59,65years) were included. IBS patients were D-IBS in 9 cases, C-IBS in 7, and A-IBS in 7 cases. IBS was post-infectious in 3 patients. Controls underwent a colonoscopy within the framework of screening. IBS symptom intensity was quantified on 10-cm VAS. On the protein extracted from colonic biopsies, the expression of tight junction proteins (claudin-1, ZO-1, occludin) was analyzed by western blot. The results, expressed as average ± mean deviation, were compared by Mann-Whitney and Kruskal-Wallis tests Results: The expression of the 3 proteins of the tight junctions was significantly lower in the patients with IBS than in the controls (Table). The comparison of the expression of proteins according to the subgroups of IBS revealed only a decrease expression of occluding in case of C-IBS vs controls (0,26±0,08; p < 0,05). The lowest expression of occludin was observed in patients with an abdominal pain intensity higher than 6 : 0,24±0,14 vs 0,55±0,16 for VAS between 3 and 6 (p < 0,05). There was also a trend for a more important decrease of occludin in case of new IBS (occurrence < 1year). Conclusion: This study shows that expression of tight junction proteins (claudin-1, occludin, ZO-1) is decreased in colonic biopsies of IBS patients. This factor could contribute to increase the intestinal permeability observed in IBS.

	IBS	Controls	p
Claudin-1	0,12±0,03	0,20±0,04	p = 0,021
Occludin	0,39±0,05	1,65±0,53	p = 0,023
ZO-1	0,29±0,04	0,55±0,13	p = 0,020

T1835

Giardiasis and Chronic Dyspeptic Syndrome

Michal Demeter, Peter Banovcin, Rudolf Hyrdel, Janka Bozickova

INTRODUCTION: Giardia lamblia (GL) is the most prevalent human intestinal parasitic protist in the world. Clinical manifestations of GL infection vary from asymptomatic infection to chronic diarrhoea. Chronic GL infection prevalence and symptomatology is unclear. We studied the presence of GL in patients with chronic dyspeptic syndrome of unknown origin. **AIMS & METHODS:** We enrolled into study 116 patients (29 males/ 87 females) with chronic dyspeptic syndrome, normal laboratory tests, negative abdominal ultrasound and upper endoscopy findings. We studied presence of selected symptoms (heartburn, dull epigastric pain, epigastric cramps, epigastric fullness, flatulence, diarrhoea), weight loss and presence of GL infection (analysis of duodenal juice aspirate collected during upper endoscopy), *Helicobacter pylori* infection (HP), and coeliac disease (CD) in examined patients. We studied symptomatology of GL positive patients 2 months after metronidazol therapy. **RESULTS:** GL infection was diagnosed in 27% (9/22) patients. GL without CD or HP was present in 12% (4/10) patients, GL and HP in 12% (4/10), GL and CD in 2% (1/1), and GL, CD and HP in 1% (0/1) of patients. Average length of dyspeptic syndrome history was 23,3 months (22/24) with weight loss of 2,8kg (3,5/2,4). Most frequent symptoms in patients with isolated chronic GL infection were epigastric fullness (86%), dull epigastric pain (50%), heartburn (43%), flatulence (36%), abdominal cramps (29%) and diarrhoea (29%). We documented total remission of symptoms in 79%(7/17) examined patients with GL infection after 14-days course of therapy with metronidazol 250 mg tid. There were no statistically