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RECENT ADVANCES IN PEDIATRIC GASTROENTEROLGY & HEPATOLOGY.

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ENSCOPY AND OBESITY:

There are no randomized controlled trials published on the efficacy of bariatric surgery in children or adolescents. The Endobarrier (GI Dynamics, Lexington, MA) is a duodenal-jejunal bypass sleeve (DJBS) that consists of a self-expanding anchor and a 60-cm polyethylene sleeve that is delivered endoscopically to the duodenal bulb and is extended into the duodenum and jejunum are studied in adults with good outcome. Gastric electrical stimulation (GES) is another procedure which can be studied in children. Laparoscopic adjustable gastric banding (LAGB) may be a treatment option for adolescents.

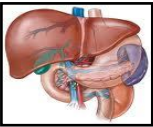
DETAILS:

Tsai WS, Inge TH, Burd RS. Bariatric surgery in adolescents: recent national trends in use and in-hospital outcome. Arch Pediatr Adolesc Med 2007;161:217–21.

Schouten R, Rijs CS, Bouvy ND, et al. A multicenter, randomized efficacy study of the EndoBarrier Gastrointestinal Liner for presurgical weight loss prior to bariatric surgery. Ann Surg 2010;251:236–43.

Tsismeli N, Coumaros D. The future of bariatrics: endoscopy, endoluminal surgery, and natural orifice transluminal endoscopic surgery. Endoscopy 2010;42:155–62.

O'Brien PE, Sawyer SM, Laurie C, et al. Laparoscopic adjustable gastric banding in severely obese adolescents: a randomized trial. JAMA 2010;303:519–26.



INFANTILE COLIC:

Lactobacillus reuteri ATCC 55730 improved colicky symptoms in breastfed infants within 1 week of treatment

Savino F, Pelle E, Palumeri E, et al. Lactobacillus reuteri (American Type Culture Collection Strain 55730) versus simethicone in the treatment of infantile colic: a prospective randomized study. Pediatrics 2007;119:e124–30.

FUNCTIONAL DIORDERS:

No studies have been published on the efficacy of antispasmodics in children.

A Cochrane's review of pediatric studies concluded that for the majority of antidepressant medications no evidence exists that supports their use for the treatment of AP-FGIDs in children and adolescents.

Children receiving peppermint oil improved in IBS severity of symptoms compared with children that received placebo (76% vs. 19% respectively).

86% of patients in the cyproheptadine group had improvement or resolution of abdominal pain compared with 35.7% in the placebo group

The use of Lactobacillus GG moderately increased treatment success in children with abdominal pain-relatedFGD, particularly among children with irritable bowel syndrome.

VSL#3 seems to be effective in ameliorating symptoms and improving the quality of life of children affected by IBS.

L. reuteri DSM 17938 may help infants with constipation.

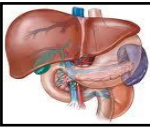
Fecal calprotectin seems to be a reliable marker in distinguishing patients with possible inflammatory processes from those with FGID

No association between recurrent abdominal pain and the prevalence of abnormal titers of antiendomysial antibody in children, therefore not supporting screening for celiac disease when symptoms are typical of pain predominant FGID

A normal ENDOSCOPY test does not always result in a therapeutic benefit for the patient while screening for RAP.

A double-blind placebo controlled study on 75 children with AP-FGIDs randomized to rifaximin or placebo, showed no significant difference between groups after 10 days of treatment.

cognitive behavioral therapy and hypnotherapy as the best studied and probably most effective types of treatment for chronic nonspecific abdominal pain.



DETAILS:

Kaminski A, Kamper A, Thaler K, et al. Antidepressants for the treatment of abdominal pain-related functional gastrointestinal disorders in children and adolescents. *Cochrane Database Syst Rev* 2011;7:CD008013.

Kline RM, Kline JJ, Di Palma J, et al. Enteric-coated, pH-dependent peppermint oil capsules for the treatment of irritable bowel syndrome in children. *J Pediatr* 2001;138:125–8.

Sadeghian M, Farahmand F, Fallahi GH, et al. Cyproheptadine for the treatment of functional abdominal pain in childhood: a double-blinded randomized placebo-controlled trial. *Minerva Pediatr* 2008;60:1367–74.

Guandalini S, Magazzu` G, Chiaro A, et al. VSL#3 improves symptoms in children with irritable bowel syndrome: a multicenter, randomized, placebo-controlled, double-blind, crossover study. *J Pediatr Gastroenterol Nutr* 2010;51:24–30.

Horvath A, Dziechciarz P, Szajewska H. Meta-analysis: *Lactobacillus rhamnosus* GG for abdominal pain-related functional gastrointestinal disorders in childhood. *Aliment Pharmacol Ther* 2011;33:1302–10.

Coccorullo P, Strisciuglio C, Martinelli M, et al. *Lactobacillus reuteri* (DSM 17938) in infants with functional chronic constipation: a doubleblind, randomized, placebo-controlled study. *J Pediatr* 2010;157:598– 602.

Olafsdottir E, Aksnes L, Fluge G, et al. Faecal calprotectin levels in infants with infantile colic, healthy infants, children with inflammatory bowel disease, children with recurrent abdominal pain and healthy children. *Acta Paediatr* 2002;91:45–50.

Fitzpatrick KP, Sherman PM, Ipp M, et al. Screening for celiac disease in children with recurrent abdominal pain. *J Pediatr Gastroenterol Nutr* 2001;33:250–2.

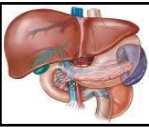
Bonilla S, DeliW, Saps M. The prognostic value of obtaining a negative endoscopy in children with functional gastrointestinal disorders. *Clin Pediatr (Phila)* 2011;50:396–401.

Collins BS, Lin HC. Double-blind, placebo-controlled antibiotic treatment study of small intestinal bacterial overgrowth in children with chronic abdominal pain. *J Pediatr Gastroenterol Nutr* 2011;52:382–6.

Chiou E. Management of functional abdominal pain and irritable bowel syndrome in children and adolescents. *Expert Rev Gastroenterol Hepatol* 2010;4:293–304.

MOTILITY DISORDERS:

Some of the available techniques that are likely to be instrumental in unraveling the genetics and pathophysiology of gastrointestinal motility disorders are done by studying the functions and associated pathways of genes involved in genetic syndromes with disturbed gut motility, more insight in complex pathophysiology. Study by Peeters and co-workers worked along these lines by reviewing the numerous clinical syndromes in which childhood constipation is a common clinical manifestation. Ten genes and 5 loci have been found to be associated with isolated Hirschsprung disease, which underlines the clinical heterogeneity of this entity.



DETAILS:

Peeters B, Benninga MA, Hennekam RC. Childhood constipation; an overview of genetic studies and associated syndromes. *Best Pract Res Clin Gastroenterol* 2011;25:73–88.

Gockel HR, Schumacher J, Gockel I, et al. Achalasia: will genetic studies provide insights? *Hum Genet* 2010;128:353–64.

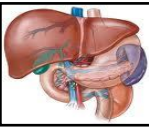
Amiel J, Sproat-Emison E, Garcia-Barcelo M, et al. Hirschsprung disease, associated syndromes and genetics: a review. *J Med Genet* 2008;45:1–14.

GERD:

Supragastric belching can be done voluntarily by some subjects, using contraction of pharyngeal muscles to push the air into the esophagus or the air can be sucked into the esophagus using simultaneous upper esophageal sphincter relaxation and diaphragmatic contraction. The air is subsequently evacuated from the esophagus using straining. This needs to be differentiated from GERD. Supragastric belching an esophageal impedance measurement can be performed and diagnosed. The diagnose of rumination syndrome is made with impedance monitoring combined with gastro-esophageal manometry is close differential to GERD. In infants and children with GERD the reported percentage of non-acid reflux varies between 50 and 85 %. The addition of the impedance monitoring to the traditional Ph monitoring resulted in a change in management in approximately. 25% of the patients. The automated analysis of esophageal impedance signals is not yet perfect. This implies that the signals must be visually inspected.

Studies for cutoff values for RI showed conflicting results, especially regarding the whole age range of the pediatric population. For routine use a RI > 3–5% in children and > 7–10% in infants may be considered pathologic. “Number of GER episodes”, “number of GER longer 5 minutes”, etc., are less reliable, not validated and should therefore no longer be used sensitivity, specificity, and clinical utility of pH monitoring for diagnosis and management of possible extraesophageal complications of GER are not well established. MII-pH seems especially promising for the detection of the association of extraesophageal symptoms with weakly and non acidic GER .But exact values are not established. Manometry is helpful in the differential diagnosis of GERD, e.g., in achalasia. However, it is not recommended for the diagnosis of GERD. Upper endoscopy with multiple biopsies is the most superior method to detect esophagitis as a consequence of GERD. Barium contrast, scintigraphy, Ultrasound are not recommended for the diagnosis of GERD.

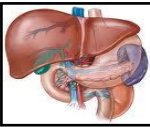
Thickening feeds should at least be tried in the treatment of healthy infants with GER, but also in infants with GERD, experiencing excessive regurgitation and/or extra-esophageal symptoms. Despite this uncertainty, in general practice a short trial of (semi)elemental formula (or, in case of breast-feeding, elimination of cow’s milk from the mother’s diet) is often the next step in treatment when other conservative options fail. Left lateral positioning (LLP) significantly reduces liquid and acid GER in both healthy preterm and term infants and those with GER disease, while right lateral positioning enhances GER No studies are available evaluating positioning regimes for children and adolescents with GERD. TLESR inhibitors seem to have great potential in the treatment of GERD, however more research is needed. Endoluminal gastroplication study is necessary before application in children. STRETTA system also needs further studies though some trials are available. To date there are no published records of



Enteryx procedure,(a liquid polymer is injected into the lower esophageal sphincter (LES) with a needle catheter via an endoscope.) use in pediatrics. Tranoral Incisionless Fundoplication (TIF) procedure using EsophyX mimics antireflux surgery in constructing an anterior partial fundoplication with tailored delivery of multiple fasteners during a single-device insertion is studied in some trials. The TIF procedure was feasible, safe (with CO₂ insufflation) and clinically effective in treating GORD in children in the medium term.

DETAILS:

- Van Wijk MP, Benninga MA, Omari TI. Role of the multichannel intraluminal impedance technique in infants and children. *J Pediatr Gastroenterol Nutr* 2009;48:2–12.
- Rosen R, Hart K, Nurko S. Does reflux monitoring with multichannel intraluminal impedance change clinical decision making? *J Pediatr Gastroenterol Nutr* 2011;52:404–7.
- Wenzl TG, Moroder C, TrachternaM, et al. Esophageal pH monitoring and impedance measurement: a comparison of two diagnostic tests for gastroesophageal reflux. *J Pediatr Gastroenterol Nutr* 2002;34:519– 23.
- Wenzl TG, Stoltenburg O, Silny J, et al. Gastroesophageal reflux and body movement in infants: Investigations with combined impedance-pH and synchronized video recording. *Gastroenterol Res Pract* 2011; doi:10.1155/2011/271404.
- Vandenplas Y, Rudolph CD, Di Lorenzo C, et al. Pediatric gastroesophageal reflux clinical practice guidelines: joint recommendations of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) and the European Society for Pediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN). *J Pediatr Gastroenterol Nutr* 2009;49:498–547.
- Horvath A, Dziechciarz P, Szajewska H. The effect of thickened-feed interventions on gastroesophageal reflux in infants: systematic review and meta-analysis of randomized, controlled trials. *Pediatrics* 2008;122: e1268–77.
- Ewer AK, James ME, Tobin JM. Prone and left lateral positioning reduce gastro-oesophageal reflux in preterm infants. *Arch Dis Child Fet Neon Ed* 1999;81:F201–5.
- Blondeau K. Treatment of gastro-esophageal reflux disease: the new kids to block. *Neurogastroenterol Motil* 2010;22:836–40.
- Liu DC, Somme S, Mavrelis PG, et al. Stretta as the initial antireflux procedure in children. *J Pediatr Surg* 2005;40:148–51.
- Cohen LB, Johnson DA, Ganz RA, et al. Enteryx implantation for GERD: expanded multicenter trial results and interim postapproval follow-up to 24 months. *Gastrointest Endosc* 2005;61:650–8.
- Cadiere GB, Van Sante N, Graves JE, et al. Two-year results of a feasibility study on antireflux transoral incisionless fundoplication (TIF) using EsophyX. *Surg Endosc* 2009;23:957–64.



EOSINOPHILIC ESOPHAGITIS:

If no specific allergen is identified, and empiric elimination diet may be tried. The most frequently empiric diet used eliminates Milk, soy, wheat, egg, fish, shellfish, peanuts and nuts, and it has been associated with a 74% response rate. If food restriction does not improve symptoms, exclusive use of an amino acid based formula can be used and is effective at resolving clinicopathological features. Children who are unresponsive to dietary restriction or who cannot tolerate dietary treatment, clearly benefit from systemic and topical corticosteroids. Topical budesonide is found to be better than fluticasone. There are now prospective controlled studies that have shown the efficacy of topical steroid treatment for EoE. A subset of patients benefits from concurrent anti-GERD therapy; those with demonstrable esophageal strictures report variable duration symptom relief after esophageal dilation.

DETAILS:

Liacouras CA, Furuta GT, Hirano I, et al. Eosinophilic esophagitis: updated consensus recommendations for children and adults. *J Allergy Clin Immunol* 2011;128:3–20.
Paediatr Drugs. 2012 Feb 1; 14(1): 23-33

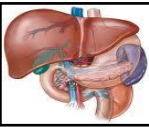
COW'S MILK ALLERGY REACTION:

The negative effects of cow's-milk consumption seem to be limited to iron status up to 9 to 12 months; then no negative effects are observed, provided that cow's milk, up to a maximum daily intake of 500 mL, is adequately complemented with iron-enriched foods. Lactose intolerance can be easily managed and up to 250 mL/day of milk can be consumed. Allergy to cow's-milk proteins is usually transient. Cow's milk stimulates IGF-1 and may affect linear growth, but association with chronic degenerative, noncommunicable diseases has not been established.

Reduced-fat milks should be considered after 24 to 36 months. **JPGN 2011;53: 594–600**
CMPA rarely develops after the age of 12 months. Improvement or disappearance of symptoms on a CMP-free diet adds substantial evidence to the diagnosis. If the reintroduction of CMP causes relapse of symptoms, the diagnosis seems established, since a challenge-test is considered as the golden standard diagnostic test. CMPA can be IGE / non IGE . serum Ig-fLC concentrations are increased in non IGE mediated CMPA. A specific short-chain galacto and long-chain fructo-oligosaccharides mixture lowers kappa and lambda Ig-fLC plasma concentrations in infants at high risk for allergies when compared to infants receiving placebo formula. specific IgE, skin prick test, patch test are for IGE mediated tests. The higher the IGE level, the more likely the allergy is going to persist.

The term "CMPI" will be used to designate group of infants with adverse reactions to CMP and no increase of specific IgE or no clear positive dermatological contact tests such as skin prick or patch tests. 5 to 10 % of the formula fed infants will develop some adverse reaction to CMP. If a thickened "regular infant formula" results in a significant reduction of episodes of regurgitation, allergy seems unlikely since protein structure did not change. Partial hydrolysates are effective in more than half of the patients with CMPA.

CMPA, the CM-free diet is recommended at least during 6–9 months and up to the age of 1 year. constipation as single manifestation of CMPA/I seems to be relatively rare.



DETAILS:

Vandenplas Y, Koletzko S, Isolauri E, et al. Guidelines for the diagnosis and management of cow's milk protein allergy in infants. Arch Dis Child 2007;92:902–8.

Ravelli AM, Tobanelli P, Volpi S, Ugazio AG. Vomiting and gastric motility in infants with cow's milk allergy. J Pediatr Gastroenterol Nutr 2001;32:59–64.

Giampietro PG, Kjellman NI, Oldaeus G, et al. Hypoallergenicity of an extensively hydrolyzed whey formula. Pediatr Allergy Immunol 2001; 12:83–6.

Schouten B, Van Esch BCAM, Kormelink TG, et al. Non-digestible oligosaccharides reduce immunoglobulin free light-chain concentrations in infants at risk for allergy. Pediatr Allergy Immunol 2011; 22:537–42.

ACHLASIA:

Pandolfino et al identified three achalasia subtypes. In type 1, no pressure waves can be recorded in the distal esophagus, type 2 is characterized by panesophageal pressurisation, whereas in type 3 at least 2 of the 10 swallows reveal rapidly propagating or spastic contractions. type 2 have best treatment response .

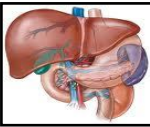
A recently developed endoscopic treatment of achalasia is peroral endoscopic myotomy (POEM) requires studies for further evaluation. Pneumatic Dilatation , treatment failure is more often observed in younger and male patients. Lap Heller Myotomy is the preferred treatment option for males below the age of 40.

DETAILS:

Pandolfino JE, Kwiatek MA, Nealis T, et al. Achalasia: a new clinically relevant classification by high-resolution manometry. Gastroenterology 2008;135:1526–33.

Inoue H, Minami H, Kobayashi Y, et al. Peroral endoscopic myotomy (POEM) for esophageal achalasia. Endoscopy 2010;42:265–71.

Richter JE, Boeckxstaens GE. Management of achalasia: surgery or pneumatic dilation. Gut 2011;60:869–76.



CONSTIPATION :

Based on colonic transit time, persistent constipation may be divided into three categories: 1) anorectal retention (outlet obstruction, dyssynergic defecation), 2) slow colonic transit and 3) normal transit. Approximately 70% of children with chronic treatment-resistant constipation have anorectal retention and 20% have slow colonic transit. In children with STC, there is a reduction in the frequency of anterior propagating contraction and loss of the increase in activity on waking and following a meal.

There is insufficient evidence that the transverse diameter of the rectum can be used as a predictor of constipation and fecal impaction.

The presence of the RAIR excludes a diagnosis of Hirschsprung's disease or anal achalasia. Although the lack of a RAIR strongly indicates the presence of Hirschsprung's disease HD, it is always necessary to confirm such diagnosis by rectal biopsy. Appendix stomas with antegrade enemas allow management in resistant cases.

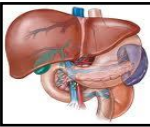
Trans cutaneous electrical stimulation is also tried with some benefit. All children with a developmental age of at least 4 years have to be instructed to try to defecate on the toilet for 5–10min after each meal (three times a day) and to complete a standardized bowel diary daily. If education, dietary measures and bowel diary with rewarding system are not sufficient within 2 weeks, medical treatment has to be started (NVK, NHG Richtlijn obstipatie bij kinderen van 0 tot 18 jaar. Utrecht; <http://www.cbo.nl;2009>.)

Complete bowel evacuation is necessary as the first step in treating chronic constipation (CC) because if initial disimpaction is omitted, maintenance therapy with oral stool softeners and laxatives may initially result in worsening of incontinence. Maintenance therapy prevents re-accumulation of stool in the rectum. Habitual, unhurried toileting needs to be encouraged, and stool softeners as well as laxatives are used for 2 to 6 months or longer. Barley cereal, barley malt extract, and certain juices can be administered after 6 months of age.

A recent systematic review found no RCT's or crossover studies that compare lactulose to placebo . Tabbers MM, Boluyt N, Berger MY, Benninga MA. Constipation in children. Clinical Evidence 2010;pii:0303.

The Dutch guideline recommends lactulose for children <1 year as first-choice treatment. For children >1 year, both lactulose and PEG (with or without electrolytes) can be used as first choice treatment NVK, NHG Richtlijn obstipatie bij kinderen van 0 tot 18 jaar. Utrecht; <http://www.cbo.nl;2009>.

NICE guideline recommends PEG plus electrolytes as first-line treatment for children of all ages. liquid paraffin should not be used in children aged under 3 years in the UK. There is very little empirical data to support use OF STIMULANT L,AXATIVE.



DETAILS:

Southwell BR, King SK, Hutson JM. Chronic constipation in children: organic disorders are a major cause. *J Paediatr Child Health* 2005;41:1–15.

Southwell BR, Clarke MC, Sutcliffe J, et al. Colonic transit studies: normal values for adults and children with comparison of radiological and scintigraphic methods. *Pediatr Surg Int* 2009;25:559–72.

King SK, Catto-Smith AG, Stanton MP, et al. 24-Hour colonic manometry in pediatric slow transit constipation shows significant reductions in antegrade propagation. *Am J Gastroenterol* 2008;103:2083–91.

Tabbers MM, Berger MY, Kurver M, et al. Accuracy of diagnostic testing for functional constipation in children: a systemic review. submitted.

Nurko S. What's the value of diagnostic tools in defecation disorders? *J Pediatr Gastroenterol Nutr* 2005;41(Suppl 1):S53–5.

King SK, Sutcliffe JR, Southwell BR, et al. The antegrade continence enema successfully treats idiopathic slow-transit constipation. *J Pediatr Surg* 2005;40:1935–40.

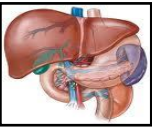
Leong LC, Yik YI, Catto-Smith A, et al. Long-term Effects of Transabdominal Electrical Stimulation in Treating Children with Slow-transit Constipation. *J Ped Surg* 2011 In press.

Bekkali NL, van den Berg MM, Dijkgraaf MG, et al. Rectal fecal impaction treatment in childhood constipation: enemas versus high doses oral PEG. *Pediatrics* 2009;124:e1108–15.

Constipation Guideline Committee of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition. Evaluation and treatment of constipation in infants and children: recommendations of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition. *J Pediatr Gastroenterol Nutr* 2006; 43: e1–e13.

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Bardisa-Ezcurra L, Ullman R, Gordon J. Guideline development group. Diagnosis and management of idiopathic childhood constipation: summary of NICE guidance. *BMJ* 2010;340:2585.



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