Gastrointestinal Problems in Children with Autism Spectrum Disorders:

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Disclosures

• I have no disclosures of any conflicts of interest.
• Case vignettes presented are based on real patients; names and some details have been changed.
Learning Objectives

• Gain familiarity with common comorbid GI conditions in children with ASD
• Demonstrate the importance of diagnosis and management of these co-morbid GI conditions in the optimal management of ASD
• Review the current status of the literature with regard to GI conditions associated with ASD
“Pedro”:

• 4 year-old boy with autism
• Long-standing very picky, high carb, low fiber diet.
• Chronic severe constipation, with stool withholding, some streaks of blood with passage of stool
• Episodic diarrhea, alternating with constipation
• Pedro is severely irritable, and spends much of each day in fetal position.
• Participates little in daily activities at preschool or home.
• Misses a great deal of school
“Pedro”:

- Abdominal X-ray shows rectal stool impaction, distension.
- Constipation is treated with:
  - Dis-impaction, with large doses of stool softener, given orally, over 3 days
  - Soft stools are maintained with low-doses of stool softener daily for one year, and—
  - 5 minute toilet sits, 4 times daily, to achieve regular pattern of soft, formed stools, 1-3 times per day
  - Fiber supplements added to diet
“Pedro”:

- Over the next few months, behavior is greatly improved
- Strong developmental progress, with improved bowel pattern (and with improved attendance at developmental preschool, participation in therapy…)
- Family believes that Pedro’s very dramatic progress is due to the “cleansing of his body of toxins” by the stool softeners
  - Is this true?
  - (Parents are happy with me for cleansing their boy of toxins….)
“Ti-An”:
• 7 year old boy with Down syndrome and autism
• Has had chronic loose stools for several months
• Onset of irritability correlates with onset of loose stools
• Irritability interferes with participation in school, therapy, and there is a decline in function.
• While waiting for CDRC appointment, family starts empiric gluten-free diet, (which they read about on the internet) and he experiences dramatic improvement in stool pattern and reduction in irritability
  – Should all kids with ASD avoid gluten?
  – Would this eliminate CDRC waiting lists?
Brief Review of the Literature

- Many small, uncontrolled studies, with no standard ASD dx, or systematic data collection re GI sx, and with discrepancies between parent report and GI report.
- That said, meta-analysis (1) found
  - 83% of studies report increased prevalence of GI symptoms in ASD patients.
  - Constipation was most frequently cited, appearing in 12 of the studies (80%),
  - followed by diarrhea reports in eight studies (53%).
  - Other GI symptoms include abdominal pain (26%), altered stool patterns (20%), bloating or gas (20%),
  - Gastroesophageal reflux disease (13%), food selectivity and rejection (13%), and difficulty swallowing (6%).
GI sx (presence and severity) assoc’d with RBBs

- Significant associations between functional constipation and rigid-compulsive and repetitive behavior, including tactile hypersensitivity/aversion were observed in a recent study with a sample size of 108 children with ASD (2)
- Incidence of constipation and food selectivity in autistic patients attributable to repetitive behavior and routines, including stereotyped diets that are usually low on fiber, fluids, etc. (3)
- Negative correlation between anxiety and sensory sensitivity was found to be significantly more prevalent in children with ASD and chronic abdominal pain than in children with ASD without abdominal issues (4)
ASD and microbiome

- Statistically significant negative correlation between the presence of autistic symptoms and bacterial richness
- Stool samples from patients with ASD and GI disturbances have higher numbers of potential pathogens. (5)
- The beneficial effects of probiotics and probiotic formulations—most of them including the Lactobacillus and Bifidobacterium species have been demonstrated in recent studies, in subjects with ASD (6, 7)
Fecal Transplant and ASD

• Recent open-label clinical trial (n=18 children with ASD): increased in bacterial diversity and 80% reduction of GI symptoms at the end of the 10 weeks treatment, including constipation, diarrhea, indigestion, and abdominal pain (15)

• Slow but steady improvement in core ASD symptoms, and the improvements were sustained after an eight-week follow-up observation period and in a recent 2 year follow-up with the same 18 participants. (16)

• Limitations:
  – Small
  – Open Label
  – Hasn’t been replicated
  – Whoa! Fecal Transplant! Yucky!
ASD and Diet

- Gluten-free or casein-free diets were reported in some studies to improve the behavioral symptoms of ASD children (8, 9)

- But---Were found ineffective in others (10,11,13,14)

- No significant correlations between consumption of gluten or casein and GI symptoms, but found a strong relationship between stress reactivity and GI problems in a sample of 120 ASD individuals (12)
Summary of Literature:

- Overall, very inconsistent results, lack of reproducibility
- Heterogeneity of populations, regarding age, gender, diet, oral antibiotic use, prebiotics, probiotics, and other medical conditions
- Lack of consistency in methods of evaluating GI symptoms--questionnaires need to rely on parental observations/ lack of agreement with GI reports
- In summary, this may explain the large variability in the prevalence of GI problems in kids with ASD reported of (9–91%)!
- But meta-analysis found that >80% of papers report elevated rates of GI sx in kids with ASD.
Pedro: Epilogue

- So, was Pedro “cleansed of toxins”?
- In all likelihood, Pedro’s low fiber diet resulted in constipation, which resulted in stool-withholding, which resulted in impaction, pain, and chronic irritability.
- As discussed, kids with ASD may have higher rates of dysbiosis—but we don’t yet know how to tweak colonic flora optimally—though there is some evidence for probiotics and certainly strong evidence for pre-biotics/ fiber in prevention/mangement of constipation/pain
- Resolution of chronic impaction and abdominal distension and pain – and consequent improved participation in school & therapy are likely the primary explanation for clinical improvement
Ti-an: Epilogue

• Chronic diarrhea or loose stools--DDx:
  – Lactose intolerance: common; associated bloating and gas can cause irritability
  – Giardia: endemic in preschools; more common with ASD (pica, oral sensory seeking) and ASD or GDD (prolonged oral phase)
  – Gluten intolerance: higher in DS. No evidence for common practice of empiric use of celiac diet, but DS healthcare guidelines recommend low threshold for testing for gluten intolerance if there are GI symptoms or behavioral symptoms.
GI-informed Psychopharmacology: Practical tips

• Stimulants & Atomoxetine
  - Can be helpful in toilet training for kids who can’t sit still on toilet long enough to defecate
  - Can exacerbate pre-existing GI pain, or cause it

• Guanfacine & Clonididine:
  - Can be helpful in toilet training for kids who can’t sit still on toilet long enough to defecate
  - But: can be constipating, so use with care—and, since these are BP meds, need to hydrate anyway!

• SSRIs:
  - Can be helpful with toilet-related anxiety.
  - Can promote GI motility
  - But: can cause loose stools or cramping, too.
Practical Summary

• The primary interventions for ASD are behavioral and educational, not biomedical

• If a provider says otherwise, be cautious, and advise caution, particularly if the provider insists that behavioral and educational interventions be put on hold, to not interfere with “biomedical” therapy

• Identify and treat co-morbid conditions including GI comorbid conditions, to optimize behavioral interventions and participation in these programs
  – In other words, low threshold for GI work-ups in kids with ASD! (Can be challenging in non-verbal kids, so may require more lab-work/ imaging
References


Thank you

• Questions?

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