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Rome Iv Functional Gastrointestinal Disorders In Children Aged 1–7 Years With Autism Spectrum Disorder: A Cross-Sectional Comparative Study

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Abstract: Background. Gastrointestinal (GI) symptoms are commonly described in children with autism spectrum disorder (ASD), and these symptoms can be accompanied by behavioral changes and changes in sleep quality, as well as added caregiver burden. There exist few state of the art data about Rome IV FGIDs in young children with ASD in Uzbekistan. [1,2,3,4,5,9].

Aim. To determine the prevalence of and the spectrum of Rome IV FGIDs among the child 1–7 year of age with ASD in Tashkent, Uzbekistan.

Methods. A cross-sectional comparative study was performed in Evimedkids Clinic (pediatric gastroenterology) and Republican Children's Psychoneurological Hospital (Tashkent) from March to April 2025. The ASD group consisted of 22 - 1–7 year-old children with DSM-5 diagnosed with ASD; Childhood Autism Rating Scale-2 (CARS-2) scores ≥30 were used. A control group of 25 age- and sex-matched children non-developing ASD was obtained from outpatient pediatric services; controls had non-GI complaints and demonstrated no clinical abnormalities. Clinical evaluation excluded children with suspected or confirmed organic GI disease. Parents filled age-appropriate versions of the Rome IV Pediatric Diagnostic Questionnaire (R4PDQ) in Uzbek or Russian. During between group comparisons, Fisher's exact test or χ^2 testing was used as appropriate. [12,13,14,15].

Results. Sex distribution was not significantly different

between groups (female: 52.0% in controls; 40.9% in ASD; p=0.640) or age (1–3 year olds: 44.0% versus 45.5%, respectively; p=1.000). At least one FGID was detected in 86.4% of children with ASD (19/22) compared with 52.0% of controls (13/25; p=0.015). Functional constipation was higher in ASD (27.3%, 6/22) than controls (4.0%, 1/25; p=0.040). Fecal incontinence was present in 63.6% of ASD children (14/22) as compared to 4.0% of controls (1/25; p=0.00002). Abdominal pain, irritable bowel syndrome, and dyspepsia have been more frequent among ASD children; however, there was no statistical significance in these three conditions (p=0.079, p=0.228, and p=0.446, respectively).

Conclusions. Rome IV FGIDs were extremely common in young children with ASD in this Tashkent sample, and the differences were greatest and most clinically actionable for functional constipation and fecal incontinence. The inclusion of routine GI symptom screening in the ASD care pathways may enhance earlier identification and management of under-documented comorbidity.

Keywords: Autism spectrum disorder; functional gastrointestinal disorders; Rome IV; constipation; fecal incontinence; pediatric gastroenterology.

1.Introduction:

Autism spectrum disorder (ASD) is a neurodevelopmental condition with enduring social-communication deficits and narrow or repetitive behaviour patterns. Besides these core characteristics, however, children with ASD frequently also suffer from medical comorbidities that can greatly interfere with care and severely impact quality of life. GI complaints, as part of gastrointestinal condition are among the most reported somatic symptoms observed in ASD and are clinically important for this group because when symptoms are unrecognized they can lead to irritability, inability to sleep or to impairment in performance, and/or mood. Specific diet and disordered eating behaviour are common features in ASD and, in ASD symptoms, possibly interact with GI symptoms through modification of the diet and stools. [1,2,5,9,11,14].

Epidemiologic studies and meta-analyses have documented significant heterogeneity in the reported prevalence of GI symptoms among children with ASD; however, evidence shows that GI complaints have a higher proportion of prevalence in ASD compared with typically developing peers. Constipation, abdominal pain, diarrhea, and associated functional bowel symptoms are consistently reported in cohorts. Under the Rome IV framework, most of these presentations are classified as functional gastrointestinal disorders (FGIDs), a group of symptom-related conditions in which structural or biochemical abnormalities that would be required to account for symptoms are not diagnosed by the standard clinical evaluations. Although FGIDs are prevalent in childhood and typically treatable, they may be missed in children with ASD because difficulties in communication can reduce symptom disclosure and the child's behavior may represent a primary clinical focus. In Uzbekistan, however, no data of Rome IV FGIDs in young children diagnosed with ASD is available, in Uzbek and Russian language, especially. [3,4,12].

Purpose of the study

The purpose of this research is to estimate the prevalence of FGID, and to analyze the distribution of Rome IV FGID subtypes within children of 1–7 years old with ASD in Tashkent province of Uzbekistan, employing the parent-report Rome IV Pediatric Diagnostic Questionnaire (R4PDQ).

2. Methods

Study design and setting. The study was conducted in Tashkent, Uzbekistan from March to April 2025, cross-sectional, on two sites: Evimedkids Clinic (pediatric gastroenterology) and the Republican Children's Psychoneurological Hospital. Participants: The ASD age group were children 1–7 years old with a clinical diagnosis of ASD according to DSM-5 criteria established according to Clinical Diagnostic Criteria and Criterion 5. ASD severity was determined as assessed with a 15-item rating system named the Childhood Autism Rating Scale-2 (CARS-2) that was constructed to differentiate ASD from intellectual disability and indicate severity of ASDs (mild-to-moderate: 30–36.5; severe: 37–60). We selected children with a CARS-2 score ≥30 for inclusion. [14,15].

Outpatient pediatric services recruited a control group of children without ASD. Controls were matched to the ASD group in age and sex. They were non-gastrointestinal complaining, with no evident clinical anomalies on assessment. Exclusion criteria: Children with suspected or confirmed organic GI disease were excluded in both groups after a pediatric gastroenterologist performed an evaluation clinically. This exclusion was done to limit analyses to Rome IV functional states, and to prevent organic disease from being misclassified as FGID.

Assessment: Parents or other carers in Uzbek or Russian filled age-appropriate R4PDQ forms, with assistance from an experienced pediatric gastroenterologist for understanding and completeness. R4PDQ applies Rome IV criteria to pediatric FGIDs and supports symptom classification for pediatric FGIDs based upon different clinical criteria including functional dyspepsia, abdominal pain–related disorders, irritable bowel syndrome, functional constipation, and functional non-retentive fecal incontinence [12,13].

Statistical analysis. Categorical variables were summarized as counts and percentages. Between-group comparisons used Fisher's exact test when expected cell counts were small; otherwise, χ^2 testing was applied. Tests were two-sided, and $p<0.05$ was considered statistically significant.

Ethics statement. For journal submission, provide the approving ethics committee/institution, approval number and date, and the informed consent procedure for parents or legal guardians.

3. Results

Participant characteristics. A total of 47 children were included: 22 in the ASD group and 25 controls. Sex distribution was similar between groups (female: 13/25 [52.0%] in controls vs 9/22 [40.9%] in ASD; p=0.640). The age distribution was also comparable, with 1–3-year-old children comprising 11/25 (44.0%) of controls and 10/22 (45.5%) of the ASD group (p=1.000).

Overall FGID prevalence. At least one Rome IV FGID was identified in 19/22 (86.4%) children with ASD compared with 13/25 (52.0%) controls (p=0.015). Using Wilson 95% confidence intervals, the prevalence of any FGID was 86.4% (95% CI 66.7–95.3) in the ASD group and 52.0% (95% CI 33.5–70.0) in controls.

Lower GI disorders. Functional constipation was reported in 6/22 (27.3%; 95% CI 13.2–48.2) children with ASD versus 1/25 (4.0%; 95% CI 0.7–19.5) controls (p=0.040). Fecal incontinence was present in 14/22 (63.6%; 95% CI 43.0–80.3) children with ASD compared with 1/25 (4.0%; 95% CI 0.7–19.5) controls (p=0.00002).

Other FGIDs. Abdominal pain was reported in 17/22 (77.3%) children with ASD and 12/25 (48.0%) controls (p=0.079). Irritable bowel syndrome was observed in 5/22 (22.7%) ASD participants versus 2/25 (8.0%) controls (p=0.228). Dyspepsia was identified in 5/22 (22.7%) ASD participants and 3/25 (12.0%) controls (p=0.446). Abdominal migraine was rare (1/22 [4.5%] in ASD vs 0/25 [0%] in controls; p=0.468).

Table 1. Participant characteristics and Rome IV FGIDs in the ASD and control groups

Characteristic	Control (N=25), n (%)	ASD (N=22), n (%)	p-value
Female	13 (52.0)	9 (40.9)	0.640
Age 1–3 years	11 (44.0)	10 (45.5)	1.000
Dyspepsia	3 (12.0)	5 (22.7)	0.446
Abdominal pain	12 (48.0)	17 (77.3)	0.079
Irritable bowel syndrome	2 (8.0)	5 (22.7)	0.228
Constipation	1 (4.0)	6 (27.3)	0.040
Abdominal migraine	0 (0.0)	1 (4.5)	0.468
Fecal incontinence	1 (4.0)	14 (63.6)	0.00002
Any FGID	13 (52.0)	19 (86.4)	0.015

4. Discussion

In this cross-sectional comparative study of 1–7 years aged children in Tashkent, Uzbekistan, Rome IV FGIDs were prevalent in the two groups but significantly more prevalent in the children with ASD. The greatest variation between the groups could be attributed to lower GI presentations, especially functional

constipation and fecal incontinence. Indeed these observations were obtained with an exceptionally small sample size and hence represent a potentially severe clinically significant load of symptomatology of functional bowel symptom in young ASD patients in the setting [3,4,6,8,9,12].

The relationships and patterns of associations are consistent with earlier international literature for relatively higher functional bowel complaints in ASD. A few mechanisms may apply. Limited diet, often associated with feeding selectivity and restrictive diets for individuals living with ASD might make them more vulnerable to develop constipation due to restricted fiber intake, fluid intake and a variety of meals. Sensory hypersensitivities decreased interoceptive recognition, and rigidity can all contribute to toileting behavior, impair stool withholding, and make toileting training difficult. Moreover, early GI symptoms may be underdiagnosed in ASD as pain is not conveyed through verbal reports and can occur via non-specific behavioral cues [1,2,5,6,11].

Constipation and fecal incontinence are conditions with known clinical diagnosis and management techniques in pediatrics from the clinical point of view. The considerable prevalence in the ASD group supports the clinical rationale for the inclusion of standardized GI screening in ASD management, and especially in the early follow-up and toilet training period. Earlier recognition may decrease preventable morbidity and mitigate secondary sleep or behavioral problems due to distress [2].

While abdominal pain, irritable bowel syndrome and dyspepsia were more prevalent in children with ASD, the differences did not reach significance. This might point to limited statistical power or heterogeneous presentation of symptoms or smaller true effect relative to constipation and fecal incontinence. Finally, future testing with larger sample sizes will refine prevalence estimates, consider determinants (diet, medication exposure, ASD severity, toilet training status) and evaluate whether targeted treatment of FGIDs leads to meaningful clinical and developmental improvement [3,4].

Limitations. The sample size was limited and clinic recruitment potentially reduced generalizability. Instead of clinician-guided diagnosis using standardized follow-up investigations, FGIDs were classified based on parent-report R4PDQ, nevertheless, it is intended to operationalize Rome IV with the aim of increasing use in pediatric populations. No tests for potential confounders such as diet composition, medication use, and specific ASD severity levels were compared [12,13].

5. Conclusions

Rome IV FGIDs were more frequently found in children diagnosed with ASD, aged 1–7 years, in this Tashkent sample compared with matched controls. Functional constipation and fecal incontinence accounted for the most pronounced differences.

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