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Functional Constipation In Iraqi School Aged Children Prevalence and Risk Factors .

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By:

Ali Hussein Jasim

Supervised by:

Assistant .Prof.Dr.Aseel Jasim Muhammed

﴿بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ﴾

﴿يَا أَيُّهَا الَّذِينَ آمَنُوا إِذَا قِيلَ لَكُمْ تَفَسَّحُوا فِي الْمَجَالِسِ فَافْسَحُوا

يَفْسَحِ اللَّهُ لَكُمْ ۗ وَإِذَا قِيلَ انشُرُوا فَانشُرُوا يَرْفَعِ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ

وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ ۗ وَاللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ﴾

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Abstract

Background : The prevalence of childhood constipation is a common problem in children and a frequent cause of hospital visit . , functional constipation (FC) symptoms including overflow incontinence and encopresis are frequently mistaken for ordinary bowel problems rather than functional constipation symptoms.

Aims of the study : To assess the prevalence of functional constipation and associated risk factors among Iraqi school aged children.

Methods : A cross sectional study was conducted in different schools in Baghdad and Diyala from November 2022 to march 2023. Total number of sample were 600 school age children .

Result : found the mean age of FC children was 11.8 years and the mean age of children without constipation was 12.3 years . the major of FC children were female (60.5%) while the major of children without constipation were male (61.4%) . 66.7% of FC children were live in urban and 72.4% of children without constipation were live in urban . The constipated children were have 44.4% anorexia , 46.9% of them have abdominal pain , 4.9% abdominal distention ,80.2 % have hard stool ,19.8% have nausea , 6.2% of them have blood in stool and 13.6% have fecal mass in LIF . The major of the sample were type school is government 62.96% and 37% were not government . major of these schools were long period of school more than 5 hour 82.7%. 74.1% were unhygienic toilet . 72.8 % were adequate toilet number . 87.7% of them were not feeling embarrassed toilet. the major of the patients were bowel habit everyday 53.1% ,4.9% of the bowel habit 1 day , 18.5% bowel habit 2 day , 22.2 % bowel habit 3 day and only one incontinence . The major of the sample were large diameter 75.3% and the major of them were short duration of constipation 66.7% . show the major of the sample were haven't history of constipation of sibling 76.55% , 81.5 % of them haven't history of constipation in parents , 65.4% mother education were primary and 67.6% of them mother occupation were employer .

conclusions

Constipation is common in Iraqi school aged children. There were significant association between FC and gender , clinical aspect (anorexia , abdominal pain , hard stool , nausea and fecal mass in LIF) , bowel habit , large diameter , duration of constipation , type of school , long period of school , unhygienic toilet , toilet number and feeling embarrassed toilet , screen time , physical disability , fiber , fluid intake .

Keywords :functional constipation , school age , Iraqi.



Introduction

One of the most prevalent health issues among school-age children is constipation. It has been challenging to treat constipation due to variations in the typical bowel pattern and symptoms that are identified as constipation accurately determine the child's condition.(1)

Moreover, functional constipation (FC) symptoms including overflow incontinence and encopresis are frequently mistaken for ordinary bowel problems rather than functional constipation symptoms. Thus, it is difficult to describe the current situation of FC in school age children.(2)

Children of school age typically have bowel movements anywhere from three times daily on average to only once every day. A maladaptive response to an unpleasant feces is associated to the pathophysiology of functional constipation. It has a substantial effect on the child's health and quality of life.(3)

Constipated children frequently see a pediatrician or general practitioner. Also, these kids are frequently seen in the emergency room or even sent into the hospital for treatment. Even though it has no connection to mortality, functional constipation has a major negative impact on quality of life. Constipation in children might have functional or natural reasons. Functional constipation (FC) is not brought on by a structural or metabolic problem, in contrast to organic reasons .(4)

Constipation brought on by organic conditions may increase the risk of patient death. With functional constipation, symptoms begin in half of

cases within the first year, and the prevalence is highest in the second and fourth years of life.(5)

Functional constipation is frequently not a self-limiting condition: despite treatment, one-third to half of patients still experience severe issues after five years, and in about 25% of cases, symptoms continue into adulthood.(6)

There is evidence of the prevalence of infantile constipation, with results varying greatly from study to study and nation to country, ranging from 1% to 30%.(7)

Classification of functional constipation.

The most prevalent type of constipation in children, accounting for 95% of cases, is functional constipation, for which there is no organic cause. Only 5% of children's cases of constipation have an underlying cause that can be identified, such as celiac disease, Hirschsprung disease, cystic fibrosis, Down syndrome, anorectal malformations, neuromuscular disorders, or spinal cord abnormalities. Constipation can also be brought on by some medications, including opiates, antacids, and anticholinergics.(8)

As a functional gastrointestinal disorder that cannot be explained by structural or biochemical findings, functional constipation is categorized as such. Infant dyschezia and nonretentive fecal incontinence are two other functional gastrointestinal disorders in kids that may be related to constipation. (9)

Infants under the age of nine months who frequently pass soft stools but exhibit constipation-like symptoms, such as crying, straining, and momentary facial redness, are said to have infant dyschezia. Nonrepresentational fecal incontinence differs from functional constipation by the presence of fecal incontinence without stool impaction, a normal number of stools, and a normal colonic transit time in children four to 18 years of age.(10)

These symptoms go away on their own and are typically caused by a discoordination of anal sphincter. Children with nonretentive fecal incontinence may experience significant psychosocial issues or neurological lesions.(11)



Material and methods.

This cross sectional study was conducted at different primary school and secondary school of Baghdad and diyala, from November 2022 to march 2023. The inclusion criteria were children of age 6-16 years who attended the school. The exclusion criteria were children already on treatment for constipation and any red flag sign or known chronic disease or symptoms suggestive of disease.

Sampling technique.

A multistage sampling technique was used to select participants. Study place was selected by simple random sampling. Ten schools were randomly selected. The schools were then stratified based on location as urban or rural and based on ownership as private or public schools. The participants were selected randomly from different class. Only those students, whose parents gave written consent willingly, were recruited in the study. The detailed clinical history, physical examination findings and investigation reports (if available) were recorded in a predesigned standard data sheet.

History was obtained directly from the students and parents, which included basic demography, age at onset of constipation/symptoms, duration of symptoms, consistency, frequency, volume/size of stool, straining, pain during defecation, bleeding per rectum/blood mixed stool, fecal soiling, abdominal pain, withholding behavior, urinary incontinence/burning urine, history of other sibs/family members affected, detailed family history.

Also history was taken regarding diet pattern (on 3 d recall method), outdoor activity/exercise, any school related condition, social history, past

medical and surgical history, history regarding the red flag signs. Physical examination of all samples was done by researcher himself. Among them who fulfilled the criteria of functional constipation were included in group 1 (children with functional constipation) and others were included in group 2 (children without constipation).

Statistical method.

After collection, data were checked manually and analyzed by computer based program Statistical package of social science(SPSS) 20 version. Results were expressed as mean \pm SD, or number or percentage. Chi-square test was used for categorical data while student t-test was used for comparison of continuous variable data. *P* value $<$ 0.05 was considered as statistically significant.



result

Total study populations were 600 and males=344, females=256. Among them, 126 (21%) children had constipation. In constipated children, 81 children fulfilled the Rome IV criteria for functional constipation and it was 13.5% of total population. Among the male children, 32 (39.5 %) and among the female children, 49 (60.5%) had constipation. Male-female ratio of constipated child was 1:1.53. Mean age of children having functional constipation was 11.8 ± 2.26 years and children without constipation were 12.2 ± 2.4 years and p value is not significant. Residential area of the studied group had no significant influence on constipation.

Table 1 :- Demographic data of children with functional constipation and without constipation.

¹Chi-square test, ² t-test, P value < 0.05 considered as statistically significant.

Characteristic	Functional constipation (n= 81) n%	Without constipation (n=474) n%	P value
Age(mean+S.D)	11.8 + 2.26	12.3 + 2.38	0.132 ²
Sex			
Male	32(39.5%)	291(61.4%)	0.02 ¹
Female	49(60.5%)	183 (38.6%)	
Residence			
Rural	17(33.3%)	131(27.6%)	0.195 ¹
Urban	54(66.7%)	343(72.4%)	

Table 2 show the clinical aspect of constipated children in compare with those without constipation .The constipated children were have 44.4% anorexia , 46.9% of them have abdominal pain , 4.9% abdominal distention ,80.2 % have hard stool ,19.8% have nausea , 6.2% of them have blood in stool and 13.6% have fecalmass in LIF .

There was significant relationship between functional constipation and anorexia , abdominal pain , hard stool , nausea and fecalmass in LIF.

Table 2: Symptoms analysis of children with functional constipation and without constipation.

¹Chi-square test, *P* value < 0.05 considered as statistically significant.

Characteristics	Functional constipation(n=81)	Without constipation (n=474)	P value
Anorexia	36(44.4%)	105(22.2%)	0.004 ¹
Abdominal pain	38(46.9%)	97(20.5%)	0.01 ¹
Abdominal distention	4(4.9%)	16(3.4%)	0.621 ¹
Hard stool	65(80.2%)	20(3.6%)	0.019 ¹
Nausea	16(19.8%)	23(4.8%)	0.02 ¹
Blood in stool	5(6.2%)	1(0.2%)	0.063 ¹
Fecalmass in LIF	11(13.6%)	0(0%)	0.002 ¹

Table 3 show the major of the patients were bowel habit everyday 53.1% ,4.9% of the bowel habit 1 day , 18.5% bowel habit 2 day , 22.2 % bowel habit 3 day and only one incontinence . The major of the sample were large diameter 75.3% .

There was significant association between functional constipation with bowel habit(every day ,2 day , 3 day) , large diameter .

Table 3 : Descriptive data of bowel habits of children with functional constipation and without constipation

¹Chi-square test, *P* value < 0.05 considered as statistically significant.

Characteristics	Functional constipation (n=81)	Without constipation (n= 474)	P value
Bowel habit			
Every day	43(53.1%)	455(95.9%)	0.021 ¹
1 day interval	4(4.9%)	16(3.4%)	0.975 ¹
2 day interval	15(18.5)	3(0.7%)	0.042 ¹
3 day interval	18(22.2%)	0(0%)	0.01 ¹
Incontinance	1(1.3%)	0(0%)	0.83 ¹
Large dimeter			0.02¹
Yes	61(75.3%)	0(0%)	
No	20(24.7%)	0(0%)	

The major of the sample were type school is government 62.96% and 37% were not government . major of these schools were long period of school more than 5 hour 82.7%. 74.1% were unhygienic toilet . 72.8 % were adequate toilet number . 87.7% of them were not feeling embarrassed toilet as shown in table 4. There were significant association between functional constipation and type of school , long period of school , unhygein toilet , toilet number and feeling embarrassed toilet .

Table 4 :School related factors analysis of children with functional constipation and without constipation

¹Chi-square test, *P* value < 0.05 considered as statistically significant

Factors	Functional constipation (n=81)	Without constipation (n= 474)	P value
Type of school			0.008¹
Government	51(62.96%)	377(79.5%)	
Non government	30(37%)	97 (20.5%)	
Long period of school			0.042¹
5H	14(17.3%)	146(30.8%)	
More than	67(82.7%)	213(44.9%)	
Unhygein toilet			0.024¹
Yes	21(25.9%)	109(23%)	
No	60(74.1%)	365(77%)	

Toilet number			0.008 ¹
Adequate	59(72.8%)	445(93.8%)	
Non adequate	22(27.2%)	29(6.2%)	
Feeling embarrassed toilet			0.009 ¹
Yes	10(12.3%)	21(4.4%)	
No	61(87.7%)	453(95.6%)	

Table 5 show the major of the sample were haven't history of constipation of sibling 76.55% , 81.5 % of them haven't history of constipation in parents , 65.4% mother education were primary and 67.6% of them mother occupation were employer . There were significant association between functional constipation and history of constipation of sibling , history of constipation in parents , mother education .

Table5 : Family related factors analysis of children with functional constipation and without constipation.

¹Chi-square test, *P* value < 0.05 considered as statistically significant.

Factors	Functional constipation (n=81)	Without constipation (n=474)	P value
History of constipation of sibling			0.001 ¹
Yes	19(23.45%)	5((1.1%)	
No	62(76.55%)	469(98.9%)	
History of constipation in parents			0.001 ¹
Yes	15(18.5%)	4(0.8%)	
No	66(81.5%)	470(99.2%)	
Family size			0.861 ¹
Only one	3(3.7%)	19(4.008%)	
2-3	40(49.4%)	232(48.9%)	
≥4	38(46.9%)	223(47.05%)	
Mother education			0.041 ¹
Primary	53(65.4%)	276 (58.2%)	
SSC	11(13.6%)	72(15.2%)	
HSC	10(12.3%)	35(7.4%)	
Honor	7(8.7%)	91(19.2%)	
Mother occupation			0.784 ¹
Housewife	26(32.1%)	143(30.2%)	
Employer	559(67.9%)	331(69.8%)	

Table 6 show the diet related factors of children with functional constipation and without constipation . 56.8% of children with FC were

take adequate fiber while 81.1% of children without constipation were take adequate fiber . 49.4% of children with FC were take adequate cow milk intake while 52.9% of children without constipation were take adequate cow milk intake. 48.1% of children with FC were take adequate fluid intake while 97.5% of children without constipation were take adequate fluid intake .the major of children with FC not take junk food 65.43% while the same percentage were in children without constipations . There were significant relationship between FC and fiber , fluid intake.

Table 6 : Diet related factors analysis of children with functional constipation and without constipation.

¹Chi-square test, *P* value < 0.05 considered as statistically significant.

Factors	Functional constipation (n=81)	Without constipation (n= 474)	P value
Fiber			0.029 ¹
Adequate	46(56.8%)	384(81.1%)	
Non adequate	35(40.3%)	90 (18.9%)	
Cow milk intake			0.573 ¹
Adequate	40(49.4%)	251(52.9%)	
Non adequate	41(50.6%)	223(47.1%)	
junk food			0.759 ¹
Yes	28(34.57%)	164(34.6%)	
No	53(65.43%)	310(65.4%)	
Fluid intake			0.028 ¹
Adequate	39(48.1%)	377(79.5%)	
Non adequate	42(51.9%)	97(20.5%)	

Table 7 show 61.7% of the sample were gamer outdoor while 38.3 % were gamer indoor . the major of the sample were screen time less than hour . There significant association between FC and screen time and physical disability .

Table 7 : physical activity related factors analysis of children with functional constipation and without constipation.

¹Chi-square test, *P* value < 0.05 considered as statistically significant.

Factors	Functional constipation (n=81)	Without constipation (n= 474)	P value
gamer			0.351 ¹

Outdoor	50(61.7%)	322(67.9%)	
Indoor	31(38.3%)	152(32.1%)	
Screen time			0.024 ¹
<1 h	43(53.1%)	373(78.7%)	
1-2 h	13(16%)	53(11.2%)	
>2 h	25(30.9%)	48(10.1%)	
Physical disability	0(0%)	2(0.39%)	0.000 ¹



Discussion.

There are very few studies and very little information about constipation in our country . In the present study the prevalence of constipation was (21%) , (13.5%) prevalence of FC which is nearly similar to a study done by MD benzamin (et al).(12) while in Saudi school aged children , prevalence was higher (32%) Hasosah M(et al) .(13) this may be related to sample size.

the major of FC children were female (60.5%) while the major of children without constipation were male (39.5%) male :female ratio was 1: 1.53 and this is significant related between gender and FC which is similar to study done in Saudi Arabia at school aged children (13) also in India kondapalli et al .(14) this may be related to colon transit time that tend to be slower in female than male , which may lead to develop constipation . the mean age of FC children was 11.8+ 2.26 years which similar to a study done by MD Benzamin (et al).(12) and Peralta-Palmezano et al.(15)

The clinical aspect of constipated children were have 44.4% anorexia , 46.9% of them have abdominal pain , 4.9% abdominal distention ,80.2 % have hard stool ,19.8% have nausea , 6.2% of them have blood in stool and 13.6% have fecal mass in LIF . There was significant relationship between functional constipation and anorexia , abdominal pain , hard stool , nausea and fecal mass in LIF and this similar to the result of Hyman et al .(16) That found that were significant relationship between anorexia , abdominal pain and nausea with FC , Oswari et al(17) showed abdominal pain strongly associated with constipation , Kondapalli (18) also found abdominal pain strongly associated with constipation

Regarding bowel habit the major of the patients with FC were bowel habit everyday 53.1% ,4.9% of the bowel habit 1 day , 18.5% bowel habit 2 day , 22.2 % bowel habit 3 day and only one incontinence . The major of the sample were large diameter 75.3. There was significant association between functional constipation with bowel habit (every day , 2 day , 3 day) , large diameter , and this result agree with Gibas et al .(19) oswari et al (17) as the presenting complaint was present in (30.6%) of children .

Regarding school related risk factors there were significant association between functional constipation and type of school (government or not) , long period of school , unhygienic toilet , toilet number and feeling embarrassed toilet and this similar to the findings of Tran et al .(20) which found that there were significant relationship between type of school , unhygienic toilet , long period of school and FC . children who feel embarrassed to use toilet at school and where toilet no. inadequate , voluntary hold defecation reflex this causes contraction of the external and sphincter muscles and pelvic floor muscle . The fecal mass then moves out of rectal ampulla and back into rectosigmoid colon , so stool became harder and larger (21) .

Hasosah et al (13) showed the facilities of their school toilets is a risk factor for FC .

Regarding family related risk factors there were significant association between functional constipation and history of constipation of sibling , history of constipation in parents , mother education and this agree with Burgers et al.(22) That found there were significant relationship between history of constipation of sibling, history of constipation in parents , mother education and FC. This may be on genetic background of slow colon transit time , also the family may consume a same food and similar lifestyle similar result found by Dehghani et al.(23), oswari et al .(17)

There significant association between FC and screen time , physical disability, fiber, fluid intake and this agree with study of Boilesen et al .(24) which found that there were significant relationship between FC and screen time , physical disability, fiber, fluid intake.

Conclusion.

Constipation is common in Iraqi school aged children. There were significant association between FC and gender , clinical aspect (anorexia , abdominal pain , hard stool , nausea and fecalmass in LIF) , bowel habit ,large dimeter , duration of constipation , type of school , long period of school , unhygein toilet , toilet number and feeling embarrassed toilet , screen time , physical disability , fiber , fluid intake .

Recommendations.

We recommended more conducting more studies on this topic with larger sample size in order to find the best solution for this problem.



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