

## Pediatrics Functional Constipation and school-Whether are linked?

### Original Article

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### Abstract

**Background:** Functional Constipation (FC) is one of the important digestive disorders in pediatrics. Its prevalence varies in different communities. The purpose of this study was to determine the prevalence of FC in our area between the school children and the impact of school on it.

**Methods:** This study was done on 4 to 12 years old children of nine schools and kindergartens of Amirkola, (2007). After completing the constipation questionnaires by parents and children, all constipated children referred to gastroenterologist to confirm the diagnosis of functional constipation. All children were followed in summer when they didn't go to school and in next year-the winter of 2009. Age, sex, the incidence of constipation in the school time and the summer holiday, health status of the toilets in school and the age of children were recorded when they learned to clean themselves.

**Results:** Of all 493 studied cases the prevalence of FC was 21.3% (105 cases). There was no significant difference between the genders ( $p=0.913$ ). All 99 constipated cases were reevaluated for constipation in summer and only 25 (18 boys and 7girls) of them were constipate. In the next school year the number of constipated case reaches to 90 cases again that there was significant relation between constipation and school months ( $p<0.01$ ).

**Conclusions:** The prevalence of FC in children was significantly high and school attendance had a great impact on it. We advise that the awareness of school officials and parents can reduce the prevalence of FC.

**Keywords:** Functional Constipation, Children, School

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### Introduction

Constipation as a worldwide problem has not a definite diagnostic criteria for both prevalence survey and clinical management and due to the difficulties of taking history from children it remains difficult to diagnose <sup>[1]</sup>. There is great literature on adult constipation in the Islamic republic of Iran and according to a systematic review its prevalence in the general population ranged between 1.4% to 37% <sup>[2]</sup> but there are limited study on the prevalence of children's constipation. Its worldwide prevalence ranged between 0.7% and 29.6% (median 12%) <sup>[3]</sup>. No organic problem was found in more than 95% of constipated children <sup>[4-6]</sup>. The peak incidence of functional constipation (FC) in preschool children is at the time of toilet training that might be due to their withholding manner and the peak in school age is in 6-7 years that might be due to their concerned about cleanliness of the toilet or anxiety and stressful life events at schools <sup>[1, 4, 7, 8]</sup>. The quality of life can be impaired in both adult and children with FC that can improve with the treatment of constipation <sup>[9]</sup>. In addition to use of laxative agents, one important point in the treatment is renovation in manner of defecation and toilet training <sup>[10]</sup>. Recent study demonstrated the important role of latrine hygiene on Sanitation behavior among school children that can prevent high percent of functional constipation among them <sup>[11]</sup>.

The purpose of this study was to determine the prevalence of FC in school children and the impact of school on it, in Amirkola, Mazandaran, in north of Iran.

## Methods

This longitudinal study was done in two kindergartens and all 7 elementary school of Amirkola during November 2007 until November 2009. All parents of preschool children who were between 4 to 6 years and of elementary school children who were between 7-12 years were interviewed by trained general practitioner. The Questionnaire was used to determine the children's bowel habit in latest three months and contained 5 main questions about the interval of defecation, Stool consistency, painful defecation, bloody stool and fecal incontinence (encopresis and soiling). Constipation was define as painful stools passage or hard Stools for 2 week or more, or defecation less than two times per week [12]. For distinguish the organic causes of constipation from functional cause, all constipate children were visited by single pediatric gastroenterologist for taking clinical history, physical examination and paraclinic tests. All cases of FC enrolled in the study and the patients with organic causes of constipation were excluded. This study was conducted over 3 stages: first stage was in school months (November 2007), second stage was in September 2008 that children didn't go to school and then they were followed in Jan 2009 when again attended in schools.

We recorded the age of 140 children of constipated and non-constipated children when they learned to clean themselves after defecation. We also checked the health status of the toilets in elementary schools with the use of a standard check list which has been used by the ministry of Education in our country and contains 8 criteria [13]. The data was analyzed by using the SPSS v.12 and Chi2 test and MC-Nemar test. A p-value of <0.05 considered significant. This study approved by Babol University of medical science ethics committee.

## Results

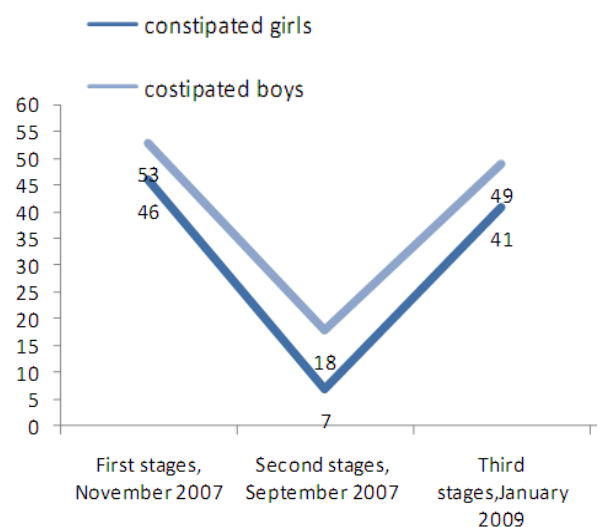
From 493 studied cases aged 4 to 12 years old (with mean age  $6 \pm 0.6$  years) 33 were in preschool group (23 boys and 10 girls) and 460 in elementary school group (237 boys and 223 girls). Generally the frequency of FC was 21.3% (105 case) and boys' frequency was higher but there was no significant

difference between the genders ( $p=0.913$ ). The frequency of FC was 18.2% in preschool children and 21.5% in elementary school children ( $p<0.05$ ) (table1). Fecal incontinency was seen in 5.27 % (26 cases) of total cases and in 24.75% of constipated cases and there was no significant deference between both sexes (17 boys and 9 girls) ( $p=0.227$ ). All 99 constipated cases were reevaluated for constipation in summer when they didn't go to school and only 25 (18 boys and 7 girls) of them was constipate. In the next school year the number of constipated case reaches to 90 cases again that there was significant relationship between constipation and school month ( $p<0.01$ ) (figure 1 and table 2). The assessment of school health service and toilet state showed that only three schools have the six of eight criteria and other four schools have only three of the eight assessed criteria.

According to cleaning by himself after defecation, the mean age were 5.9 and 6.1 years in constipated and non-constipated groups, respectively ( $p>0.05$ ).

**Table 1: Prevalence of chronic constipation in kindergartens and elementary schools children respect to gender**

Children	Sex	Constipated N (%)	Not constipated N (%)	P
Pre school	boys	3 (13)	20 (87)	0.0734
	girls	3 (30)	7 (70)	
Elementary school	boys	53 (22.4)	184 (77.6)	0.336
	girls	46 (20.6)	177 (79.4)	



**Figure 1: The frequency of functional constipation in different stages of study**

**Table 2: Distribution of functional constipation in different stages of study in follow up respect to sex**

Sex	First stages Nov 2007 N (%) <sup>*</sup>	Second stages Sep 2007 N (%) <sup>*</sup>	Third stages Jan 2009 N (%) <sup>*</sup>
Female (N=260)	46 (17.7)	7 (2.7)	41 (16.4)
Male (N=233)	53 (22.7)	18 (7.7)	49 (21)
Total (N=493)	99 (20.1)	25 (5.1)	90 (18.3)

\* P=0.000

## Discussion

In this study more than one-fifth of children had FC. It is a high prevalence and school attendance had a great influence on the stability of problem. According to different study across the world, the prevalence of children constipation had wide range of variation. It was 12.2% in Hong Kong study, 32.3% in Taiwan and 29.2% in Sari (Iran) [4, 7, 14]. A systematic review reported the prevalence rate of constipation in children between 0.7% to 29.6% worldwide [3]. Unfortunately, there isn't a comprehensive study about prevalence of constipation among children in Iran. This difference may be due to the lack of single definition of constipation, different geographic locations, different methods of study and sample collection especially before the providing of Rome III criteria. In our study the prevalence of FC was 18.1% among 4 to 6-year-old children and increased to 22.8% in children over 6 years. In one study has reported different associations of age and constipation [3].

So, the constipation is less prevalent with increase of age above 6 years old in Hong Kong and Taiwanese children over 7 years old [1, 4]. In another study in Hong Kong the frequency of constipation in eight-year-old children was less than 10 percent [7]. The cause of less prevalence of FC in 4 to 6 years-old children in our study maybe related to less time of attendance in school compared to the higher age group. We didn't have any significant sex difference in prevalence of constipation. A systematic review showed that it was more prevalent in girl than boys in three study [3]. There was not conclusive evidence indicated that the impact of sex on the prevalence of childhood constipation.

Fecal incontinency was 5.27% of children in our study and there was no significant difference between boys and girls ( $p>0.05$ ), but in Rajindrajith et al.'s study, fecal incontinence was 0.8-7.8% and there was

significant difference between male to female ratio from 3:1-6:1 [5].

Other interesting results of this study were the significant decrease incidence of constipation in children during the summer when they didn't go to school and the second peak of increased prevalence of FC accrued in the next school year. This result indicated the effect of school time on the continuing FC. It may be due to several factors like avoiding defecation in school and unfavorable sanitary conditions in schools [8, 11]. Most schools in our study did not have ideal level of sanitary services same as Xuan, Le thi Thanh et al.'s study [11]. The mean age of obtain the ability of cleaning itself alone after defecation was almost equal between the constipated and non-constipated groups. This finding and lack of difference in prevalence of constipation in 4-6 and over 7-year-old child indicated that the child ability of cleaning itself after defecation did not have an effective role on constipation and its severity in school age children. As a result, the prevalence of FC in children was significantly high and school attendance has had a great impact on it. We think that the awareness of school officials and parents can reduce the prevalence of FC.

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**Ethical approval:** This study obtained ethics committee approval.

**Conflict of interest:** There was no conflict of interest.

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