YAŞ GRUPLARI VE ŞİKAYET SÜRELERİNE GÖRE FONKSİYONEL KABIZLIĞI OLAN ÇOCUKLARIN KLİNİK BULGULARI: BİR MERKEZ DENEYİMİ

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CLINICAL FINDINGS OF FUNCTIONAL CONSTIPATION IN CHILDHOOD ACCORDING TO THE DIFFERENT AGE GROUPS AND DURATION OF SYMPTOMS: ONE CENTER EXPERIENCE

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ÖZET

Amaç: Kabızlık dünya çapında en yaygın pediatrik sorunlardan biridir. Bu çalışmanın amacı, fonksiyonel kabızlığı olan çocukların klinik özelliklerini belirlemek, yaş gruplarına ve kabızlık sürelerine göre farklılıkları tartışmaktır.

Yöntemler: Retrospektif olarak, pediatrik gastroenteroloji polikliniğimizde tedavi edilen fonksiyonel kabızlığı olan tüm hastalar dahil edildi.

Bulgular: Bu çalışmaya ortalama ± SEM yaşı 61,2 ± 2,3 ay olan 251 (%57,4) kadın ve 186 (%42,6) erkek dahil edildi. Ortalama ± SD konstipasyon süresi 18.5 ± 1.1 aydı. Kabızlık süresinin artan yaşla birlikte arttığı bulundu (p <0.0001 eğilimi için). Sert ve iri dışkı insidansı yaşla birlikte anlamlı artış gösterirken (p<0.0001), pelet benzeri dışkı insidansı yaşla birlikte giderek azaldı (p<0.0001). Defekasyon sıklığı artan yaşla birlikte anlamlı olarak daha az yaygındı (p<0.0001). Anal fissür en sık 1-24 ay arasında %50 ile görüldü (p<0,0001).

Sonuç: Yaş grubu ve konstipasyon süresine göre bazı klinik özelliklerin ön plana çıktığı görüldü. Tedavinin farklı klinik özelliklere ve bu tedaviye verilen cevaba göre seçilmesinin gerekip gerekmediğini belirlemek için daha ileri çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Kabızlık, çocukluk, konstipasyon, klinik belirti, fonksiyonel konstipasyon

ABSTRACT

Objective: Constipation is one of the most prevalent global pediatric problem. The aim of our study was to identify the clinical distinctive of children with functional constipation and to discuss the differences according to age groups and durations of constipation.

Methods: Retrospectively, all children with functional constipation cured at our pediatric gastroenterology outpatients department were included.

Results: This study included 251 (57.4%) females and 186 (42.6%) males with a mean ± SEM age of 61.2 ± 2.3 months. The mean ± SD constipation duration was 18.5 ± 1.1 months. The constipation duration was found to increase with increasing age (p for trend <0.0001). While the incidence of hard and large stools showed a significant rise with increasing age (p<0.0001), pellet-like stool incidence gradually diminished with increasing age (p<0.0001). Defecation frequency was significantly less common with increasing age (p<0.0001). Anal fissure was the most common in the 1-24 months age group at a rate of 50% (p<0.0001).

Conclusion: Certain clinical characteristics were seen to become emphasized according to the age group and constipation duration. Further studies are needed to determine whether treatment should be chosen according to the different clinical characteristics and the response to such treatment.

Keywords: Constipation, childhood, constipation, clinical manifestation, functional constipation

INTRODUCTION

Constipation is one of the most prevalent problems of childhood. The prevalence of functional constipation in children worldwide is 0.7-29.6% (1,2). Functional constipation is the cause in 3% of presentations to the general pediatric outpatients and 10-25% of presentations to the pediatric gastroenterology outpatients (1,3,4,5). Constipation can be defined in several ways. Hard defecation, thick defecation, infrequent defecation, defecation less than 3 per week, hard passage, painful defecation or willingly suppressing defecation are some definitions of constipation (6). Constipation can cause gastrointestinal problems such as fecal impaction, fecal soiling, abdominal pain, anal pruritus, rectal bleeding, and loss of appetite as well as non-gastrointestinal system complications such as urinary tract problems (7). There are only a few studies investigating the incidence of presentations by children with functional constipation (7,8). Based on our observations, clinical characteristics can vary in different age groups. Besides, the symptoms and physical examination findings can change according to the durations of constipation.

The aim of our study was to identify the clinical distinctive of children with a symptom of constipation that were brought to the pediatric gastroenterology outpatients department and to discuss the differences according to age groups and durations of constipation.

MATERIAL AND METHODS

The files of 437 cases between the ages of 1 month and 16 years who were diagnosed with functional constipation among the 4572 patients who presented to Denizli State Hospital's Pediatric Gastroenterology Outpatients Department were evaluated retrospectively. The author was only pediatric gastroenterologist who worked at Denizli State Hospital. Therefore, clinical evaluation of all patients was done by the same physician. Patients with an organic reason for the constipation (such as Hirschprung's disease, spina bifida, anorectal anomalies, endocrine, allergic and metabolic diseases) and patients with severe neurological problems were excluded from the study. The Rome IV criteria were used to diagnose functional constipation (9,10):

Neonates and Toddlers (9)

Infants up to 4 years of age must have at least 2 of the following symptoms for 1 month:

- Two or fewer defecations per week
- History of excessive stool retention
- History of painful or hard bowel movements
- Presence of a large fecal mass in the rectum
- History of large-diameter stools
- Presence of a large fecal mass in the rectum

The following additional criteria can be used for toilet-trained children:

- At least 1 episode/week of incontinence after the acquisition of toileting skills
- History of large-diameter stools thay may obstruct the toilet

Children and Adolescents (10)

Must include 2 or more of the following occurring at least once per week for at least 1 month with insufficient criteria for the diagnosis of irritable bowel syndrome:

- Two or fewer defecations in the toilet per week in a child of a developmental age of at least 4 years
- At least 1 episode of fecal incontinence per week

- History of retentive posturing or excessive volitional stool retention
- History of painful or hard bowel movements
- Presence of a large fecal mass in the rectum
- History of large diameter stools that can obstruct the toilet

Accordingly, children complaining of a defecation frequency of 2 or less per week, fecal incontinence a minimum of once a week, large stools, painful defecation, withholding behavior and with hard stools in the rectum were accepted as constipated. The patients were divided into four age groups as 1-24 months, 25-60 months, 61-120 months and 121-192 months and also into two groups according to constipation duration as 6 months and less and longer than 6 months. Information on the age at presentation, detailed history regarding constipation, presentation symptoms, physical examination findings, and frequency of defecation were obtained from the patient charts and compared by age group and durations of constipation.

This study was approved by the local ethics committee.

Statistical Analyses

All statistical analyses were performed using the SPSS statistical software, version 18.0 (SPSS Inc, Chicago, Illinois). The chi-square test or Fisher's exact test, where appropriate, were used to compare proportions in different groups. All numeric variables were explored to determine whether or not they are normally distributed. Kruskal-Wallis test was used for statistical comparisons of numeric variables that are not normally distributed. Mann-Whitney U or One way ANOVA tests were used for statistical comparisons of normally distributed numeric variables in two or three and more groups, respectively. A p value of less than 0.05 was considered to indicate a statistically significant result.

RESULTS

Our study was conducted with 437 patients who were diagnosed with functional constipation among the 4572 patients who presented to the pediatric gastroenterology outpatients within a period of 24 months. Accordingly, 9.5% of the patients presenting to the pediatric gastroenterology outpatients complained of functional constipation. The mean age of the patients and the standard error of the mean (SEM) was 61.2 ± 2.3 months and 104 (23.8%) were aged 24 months or less; 177 (40.5%) were aged 25-60 months, 92 (21.1%) were aged 61-120 months and 64 (14.6%) were aged 121-192 months. The ratio of the female children was significantly more than the male children within the overall population [251 (57.4%) females and 186 (42.6%) males] (p=0.002). When the distribution of gender by age group was examined, the female gender ratio was highest in the 121-192 months age group (55.8%, 52%, 56.5% and 76.6% for age groups of under 2 years, 25-60, 61-120 and 121-192 months, respectively)(Figure 1).

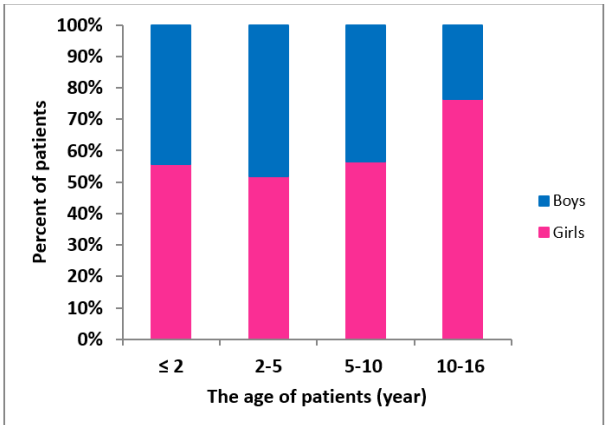

Figure 1. Gender distribution according to the age groups

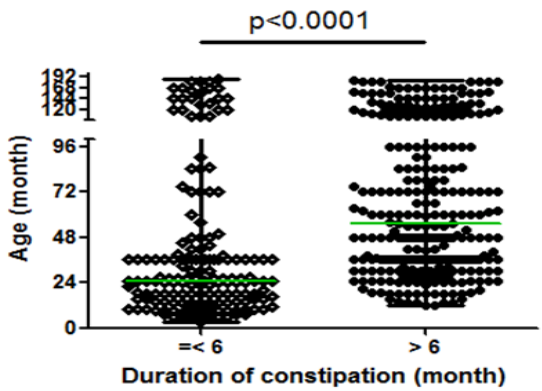

Figure 2. The distribution of age in children according to the duration of constipation

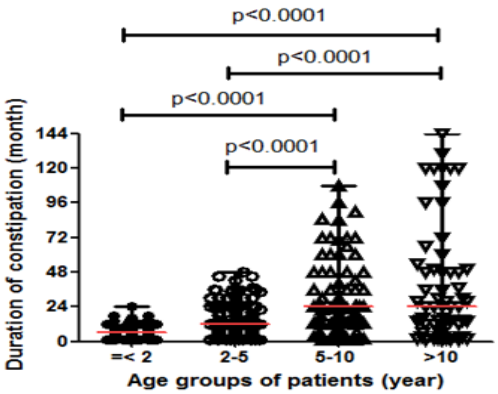

Figure 3. Duration of constipation according to the age groups

The mean constipation duration of the patients before presentation was 18.5 ± 1.1 months (min. 1 month, max. 144 months). A total of 23 (%5.3) patients had experienced constipation symptoms for longer than 5 years. These symptoms had continued for 6 or less months in 161 (36.8%) patients and longer than 6 months in 276 (63.2%) patients. The mean age of the patients with constipation longer than 6 months was significantly higher than those with a symptom duration of 6 months or less (71 ± 2.8 vs. 44.3 ± 3.7 months, respectively) (p<0.0001) (Figure 2).

The constipation duration varied significantly between the age groups. Constipation durations in children aged 24 months or less and those aged 25-60 months, 61-120 months and 121-192 months were 6.2 ± 0.5 months, 13.9 ± 0.8 months, 28.7 ± 2.5 months and 36.5 ± 4.9 months, respectively (p<0.0001) (Figure 3). The constipation duration was found to increase with increasing age (p for trend <0.0001). There was no difference in constipation duration between the genders.

The clinical characteristics of the patients at all ages and by age group are presented in Table 1. The incidence of hard and large stools showed a significant increase with increasing age (p<0.0001). Pellet-like stool was more common in children aged 1 to 24 months (p<0.0001) and the incidence gradually decreased with increasing age. Withholding behavior was significantly more common at the age of 25-60 months (21.5%, p:0.015). Presentation with abdominal pain was significantly more common in patients aged 5 and above (p<0.0001). Fecal soiling was most commonly seen in the 61-120 months age group (p:0.048). Bloody clot in the feces and painful defecation rates were similar between the age groups.

Recurrent urinary tract infection was seen in 9 patients and 6 were in the 25-60 months age group. Rectal prolapse was found in one patient aged 25-60 months and two patients aged 61-120 months. Defecation frequency was significantly less common with increasing age (p<0.0001).

The rate of a pathological finding on physical examination of the patients with functional constipation was % 66.7. Anal fissure was the most common sign in the 1-24 months age group at a rate of 50% (p<0.0001). Hard stool in the rectum was the most common finding in those younger than 5 years with 57.7% in patients aged 1-24 months and 48.6% in those aged 25-60 months (p<0.0001). The anal skin tag rate was significantly higher over the age of 5 (p<0.0001). Hemorrhoids were more common with increasing age (p:0.013).

Table 1. Clinical manifestations and physical examination findings according to the age groups

Clinical features*	Total (n=437)	Group 1 ≤ 24 m (n=104)	Group 2 25-60 m (n=177)	Group 3 60-120 m (n=92)	Group 4 121-192 m (n=64)	p†
Hard and large stool	282 (64.5)	38 (36.5)	125 (70.6)	67 (72.8)	52 (81.3)	**<0.0001**
Pellet-like stool	103 (23.6)	59 (56.7)	32 (18.1)	8 (8.7)	4 (6.3)	**<0.0001**
Withholding behavior	70 (16)	14 (13.5)	38 (21.5)	15 (16.3)	3 (4.7)	**0.015**
Abdominal pain	61 (14)	1 (1)	11 (6.7)	28 (30.4)	21 (32.8)	**<0.0001**
Fecal soiling	25 (7.5)	-	11 (6.2)	12 (13)	2 (3.1)	**0.048‡** (LR)
Bloody clot in feces	84 (19.2)	25 (24)	28 (15.8)	17 (18.5)	14 (21.9)	0.362
Painful defecation	22 (5)	6 (5.8)	9 (5.1)	3 (3.3)	4 (6.3)	0.820
Urinary problems	9 (2.7)	-	6 (3.4)	2 (2.2)	1 (1.6)	0.680‡ (LR)
Rectal prolapsus	3 (0.9)	-	1 (0.6)	2 (2.2)	0 (0)	0.271 (LR)
Defecation frequency						
1-2 days/ week	148 (33.9)	19 (18.3)	54 (30.5)	38 (41.3)	37 (57.8)	**<0.0001**
3-7 days/ week	289 (66.1)	85 (81.7)	123 (69.5)	54 (58.7)	27 (42.2)	
Abnormal physical exam	287 (66.7)	84 (80.8)	117 (66.1)	52 (57.8)	34 (57.6)	**0.002**
Anal fissure	126 (29.3)	52 (50)	45 (25.4)	15 (16.7)	14 (23.7)	**<0.0001**
Hard stool in rectum	186 (43.3)	60 (57.7)	86 (48.6)	29 (33.2)	11 (18.6)	**<0.0001**
Skin tag	51 (11.9)	2 (1.9)	16 (9)	20 (22.2)	13 (22)	**<0.0001**
Hemoroid	8 (1.9)	-	1 (0.6)	4 (4.4)	3 (5.1)	**0.013‡** (LR)

*All clinical parameters is given as n (%).

†p value were obtained by comparison of the 4 groups

‡p value were obtained by comparison of 2. , 3. and 4. groups.

The clinical characteristics of the patients according to constipation duration are presented in Table 2. A hard and large stool was significantly more common when the constipation duration was longer than 6 months (p:0.002) and a pellet-like stool was significantly more common in patients with a constipation duration less than 6 months (p<0.0001). While withholding behavior and fecal soiling were more common with a constipation duration of more than 6 months (19.2% vs. 10.6% (p=0.017) and 8% vs. 1.9% (p=0.008), respectively), there was no relationship between the constipation duration and the incidence of other symptoms such as abdominal pain, bleeding with defecation, painful defecation and rectal prolapse. The rate of abnormal signs in general was similar in those with a constipation duration of 6 months or less or more than 6 months. However, when we analyzed the abnormal signs one by one, anal fissure was more common with constipation duration shorter than 6 months (40.6% vs. 22.6%, p<0.0001, respectively) while skin tag (3.8% vs. 16.7%, p<0.0001, respectively) and hemorrhoids (0% vs. 3%, p:0.028, respectively) were more common when the constipation had continued for more than 6 months. The presence of hard stool in the rectum was not influenced by the constipation duration. The constipation duration was significantly more commonly over 6 months in those with a defecation frequency of 1-2 days a week. The constipation duration was significantly more commonly 6 months or less in those with a constipation frequency of minimum 3 days a week or every day (p<0.001).

Table 2. The comparison of clinical manifestations with duration of constipation

Clinical features*	Duration of constipation ≤6 ay (n=161)	Duration of constipation >6 ay (n=276)	p
Hard and large stool	89 (55.3)	193 (69.9)	**0.002**
Pellet-like stool	57 (35.4)	46 (16.7)	**<0.0001**
Withholding behavior	17 (10.6)	53 (19.2)	**0.017**
Abdominal pain	16 (9.9)	45 (16.3)	0.064
Fecal soiling	3 (1.9)	22 (8)	**0.008**
Bloody clot in feces	37 (23)	47 (17)	0.128
Painful defecation	10 (6.2)	12 (4.3)	0.390
Urinary problems	1 (0.6)	8 (2.9)	0.164 (F)
Rectal prolapsus	0 (0)	3 (1.1)	0.300 (F)
Abnormal physical exam	110 (68.8)	177 (65.6)	0.497
Anal fissure	65 (40.6)	61 (22.6)	**<0.0001**
Hard stool in rectum	69 (43.1)	117 (43.3)	0.966
Skin tag	6 (3.8)	45 (16.7)	**<0.0001**
Hemoroid	0 (0)	8 (3)	**0.028 (F)**
Defecation frequency			
1-2 days/ week	35 (21.7)	113 (40.9)	**<0.0001**
3-7 days/ week	126 (78.3)	163 (59.1)	

* All clinical parameters is given as n (%)

DISCUSSION

Our study is important as it is a single-center study with a large cohort revealing the clinical features of functional constipation in childhood according to different age groups and constipation durations. Pellet-like stools, anal fissure and hard stool in the rectum were shown to be significantly more common in children under the age of 2 years while hard large stool and abdominal pain were more common over the age of 10. Withholding behavior was more common at 25-60 months, fecal soiling at 61-120 months and skin tag and hemorrhoids after the age of 5 years. The defecation frequency showed a significant decrease as the age increased.

Different studies have reported functional constipation to be more common in either females or males or to have no gender predisposition (7,8,11-22). The gender rates were similar in the group aged 5 years and less but there was a significant increase in females over the age of 5. Female patients were more common in the total group and this difference was most significant in the 120-192 months age group. The different gender rates in different studies can stem from the differences in sociocultural characteristics and nutritional habits in the study population.

Patients with a constipation duration longer than 6 months were older than those with a constipation duration less than 6 months and the constipation duration increased significantly with age. A similar result was also found in another study where the mean constipation duration was found to increase significantly in the groups with more advanced age (23).

A history of hard and large stools was present in 64.5% of all our patients. This rate was similarly 60% in the study of Chang et al, 75% in a review and as high as 90% and 93.7% in two other studies (1,7,23,24). These different rates may stem from the size of the study group or the differences between the age groups. We found no difference between the female and male genders in terms of hard and large stools.

A history of pellet-like stools, which is not included in Rome IV criteria, was reported at a rate of 23.6% and abdominal pain was reported at a rate of 14% in our study. The abdominal pain rate increased with age while the pellet-like stool rate increased with decreasing age. The rate of pellet-like stool has been reported as 38.9-61% (7,16,17,21) and the rate of abdominal pain as 12.2-66% (7,16,19,21,25) in several studies. Constipation was found in 46% of the children who presented with recurrent abdominal pain in another study (26). Painful defecation has been reported at rates of 6.7-95.8% in various studies (1,7,16,17,20,21,24). The painful defecation rate was 5% in our study and was lower than reported in other studies. The typical withholding behavior, which is an effort to prevent or delay defecation, was found at a rate of 16.9% by Aydogdu et al. (16) while other studies reported rates up to 79% (1,17,24,27,28). The highest reported rate was 91.9%, by Dehghani et al (7). This rate was 16% in our study, similar to other studies conducted in our country.

Fecal soiling was existent in 7.5% of the cases in our study. The relevant rate was 7% (21), 10.4% (20), 16.7% (17) and 51.7% (16) in other studies conducted in our country. The rate was 33.8-90% (1,7,29,30) in other studies in the literature. Medeiros et al. reported fecal soiling rate by age group as 75.6% in pre-school age group, 68.2% in the school age and 76.7% in adolescents. Besides, they reported fecal soiling rates in school age children to be higher in males (80.7%) than females (50%) (8). Similarly, Dehghani et al. also reported this problem to be more common in males than females (40.8% and 28.2%, respectively) (7). Aydogdu et al. also found the fecal soiling rate to be high in males (60.6%) but there was no difference between children with or without encopresis in terms of the defecation pattern and incidence (16). Fecal soiling was the most common sign between the ages of 5 and 10 years in our study where 56% (n=14) were male and 44% (n=11) were female. No significant difference was found between the genders in terms of fecal soiling. No difference was found between the children with fecal soiling in terms of defecation frequency and stool form.

Bleeding with defecation has been reported in 8.3-32.4% of the subjects in various studies (7,16,17,20,25). This rate was 19.2% in our study and consistent with the literature. We found no relationship between bleeding with defecation and

Anal fissure, skin tag, painful and bloody stool, and rectal or abdominal fecal masses can be present in the history or on physical examination of children with constipation (30). The anal fissure incidence was 29.3% overall in our study. Anal fissures have been reported at rates of 7.2-51% in various studies (7,16,17,19,21,32). As far as we are aware, no difference was reported according to the age group in previous studies. Anal fissures were most common in the 1 to 24 months age group, at a rate of 50% in our study. This suggests one of the first signs of functional constipation is anal fissure. However, anal fissure was more common in the patient group with constipation shorter than 6 months when we examined the relationship of anal fissure with constipation duration.

The skin tag rate has been reported as 5% in a previous study (32). This rate was 11.9% in our study. Skin tags were significantly more common in the 61-120 months and 121-192 months age groups. Skin tags naturally occur as a result of chronic constipation and the rate was therefore very high in patients with constipation of more than 6 months ($p<0.0001$). Hemorrhoids can occur as a result of chronic straining (33). Şahin et al. reported the hemorrhoid incidence as 6%. This rate was quite low in our study at 1.9%. As expected, the presence of hemorrhoids was also found to be related to the constipation duration.

When we compared the defecation frequency and constipation duration of our patients, the constipation duration was significantly more commonly over 6 months in those with a defecation frequency of every 1-2 days while it was usually 6 months or less in those with a defecation frequency of three times a week or every day. This indicates that patients with a defecation frequency of twice a week or less have slow colon transit time with possible prolonged constipation duration.

As stated above, the clinical characteristics of functional constipation can change between the age groups and can also vary according to the constipation duration in the various studies conducted. This can be explained by diet habits, socio-cultural situation, climate conditions, lifestyle and compliance with treatment.

To the best of our knowledge, this is the first study conducted from a single center in our country evaluating the clinical characteristics of functional constipation according to age group and constipation duration. Certain clinical characteristics were seen to become emphasized according to the age group and constipation duration. Further studies are needed to determine whether treatment should be chosen according to the different clinical characteristics and the response to such treatment.

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