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Infants with Infrequent Stools Rarely Require Treatment

Seyrek Dışkılayan Bebeklere Nadiren Tedavi Gerekir

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ABSTRACT

Objective: Infrequent stools (IS) refer to passage of stool that is delayed for days but has normal consistency and color. There is a paucity of information about infrequent stools in infants and children aged less than 6 months who are exclusively breastfed. Herein, we investigated the signs and symptoms of ISin order to discuss its course, duration, and need for treatment, and the efficacies of available treatments. We also aimed to determine the aspects of a clinically appropriate approach for affected patients.

Material and Methods: This study included newborns and infants aged less than 6 months who presented to our outpatient clinic with a history of not having passed stools for 2 days or longer. We exclusively reviewed the medical records of infants who were exclusively breastfed, who had a decent weight gain, who had passed meconium in time, and who were free of hard stools, abdominal swelling, or anal problems. During follow-up, all infants underwent physical examination, their nutritional status was questioned and their growth charts recorded. Additionally, tests and treatments performed for infrequent stools were reviewed in detail.

Results: The study included a total of 50 infants with a mean age of 55.7 days. The mean birthweight was 3179±539 gr. The mean age at onset of infrequent stools was 48.52±39.21 days (range: 2 days-5.5 months). The mean duration of the first infrequent stools was 4.7±1.59 days (95% CI: 4.2-5.2); the mean duration of infrequent stools was 2 months (range: 2 weeks-5.5 months, 95%CI: 45.7-71.9). Infrequent stools lasted for 2 months in 75% of patients. Weak correlations were found between birth weight and infrequent stools (r=0.35) and between gestational age and infrequent stools (r=0.33). Seven children were examined at other centers, and 36 children were administered various treatments either by physicians or parents. Medical treatment was not needed in any patient.

Conclusion: In conclusion, infrequent stools improved in all children included by this study, and this condition did not transform into functional constipation in any of them. It was observed that infrequent stools was a transient condition requiring no treatment in infants and children who were adequately nourished, who gained adequate weight, and who were free of abdominal swelling or hard stools. It usually suffices to follow this condition conservatively after it is distinguished from constipation. We believe that this information would be useful for pediatricians, pediatric surgeons, and physicians and nurses working on the field.

Key Words: Breast milk, Constipation, Infant, Infrequent stools

ÖZ

Amaç: Seyrek dışkılama (SD) günlerce gecikmiş, fakat normal kıvam ve renkteki dışkılamayı tarif eder. Literatürde altı aydan küçük olup, anne sütü ile beslenen bebek ve çocuklarda seyrek dışkılama ile ilgili çok az bilgi vardır. Çalışmada, SD'sı olan bebeklerin bulgu ve semptomları ele alınarak, SD'nın seyrinin, ne kadar devam ettiğinin, yapılan tedavilerin etkinliğinin, tedavi gereksinimlerinin tartışılması, doğru yaklaşımın nasıl olması gerektiğinin saptanması amaçlandı.

Gereç ve Yöntemler: Çalışmaya, polikliniğimize 2 gün ve üzeri kaka yapmama şikayeti ile getirilen 6 aydan küçük yenidoğan ve süt çocukları dahil edilmiştir. Sadece anne sütü ile beslenen, kilo alımı iyi olan, mekonyumunu zamanında çıkarmış, sert dışkılaması, karın şişliği ve anal bölge sorunları olmayan çocukların bilgileri geriye dönük incelendi. Takiplerinde fiziki muayeneleri yapılmış, beslenme durumları sorgulanmış, büyüme eğrisi kaydı tutulmuştur. Ayrıca seyrek dışkılaması nedeni ile yapılan tetkikler ve tedaviler irdelenmiştir.

Bulgular: Çalışmaya toplam 50 bebek (ortalama yaş: 55.7 gün) dahil edildi. Ortalama doğum ağırlığı 3179±539 gr'dı. Seyrek dışkılama ilk olarak ortalama 48.52±39.21 günde (aralık: 2 gün-5.5 ay) başlamıştır. İlk seyrek dışkılamanın devam

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etme süresi ortalama 4.7±1.59 gün (% 95 GA: 4.2-5.2), seyrek dışkılamaların toplamının devam etme ortalaması ise 2 ay olmuştur (aralık: 2 hafta-5.5 ay, % 95 GA: 45.7-71.9). Seyrek dışkılama hastaların % 75'inde 2 ay sürmüştür. Doğum ağırlığı ile seyrek dışkılama (r=0.35) ve gebelik haftası ile seyrek dışkılama arasında (r=0.33) zayıf ilişki saptanmıştır. Yedi çocuk farklı merkezlerde tetkik edilmiş, 36 çocuğa ise ya hekimler ya da ebeveynler tarafından çeşitli tedaviler uygulanmıştır. Hiçbir hastada tıbbi tedaviye ihtiyaç duyulmamıştır.

Sonuç: Sonuç olarak, çalışmaya dahil edilen tüm çocuklarda seyrek dışkılama durumu geçmiş, bu durum hiç bir hastada fonksiyonel kabızlığa dönüşmemiştir. İyi beslenen, huzurlu, yeterince kilo alan, karın şişliği ve sert dışkılaması olmayan bebek ve çocuklarda seyrek dışkılamanın geçici bir durum olduğu, tedaviye gerek olmadığı görülmüştür. Seyrek dışkılamanın kabızlıktan ayırımı yapıldıktan sonra tedavisiz takip edilmesi yeterlidir. Bu bilginin pediatristler, pediatrik cerrahlar, sahada çalışan hekim ve hemşirelere faydalı olacağı kanısındayız.

Anahtar Sözcükler: Anne sütü, Kabızlık, Bebek, Seyrek dışkılama

INTRODUCTION

Regular defecation is a sign of good health in infants and children (1,2). Many studies have studied the normal defecation frequency in newborns and infants (1-6). Those studies have determined that the defecation frequency of breastfed infants is physiologically reduced with aging. A study showed that the defecation frequency decreased from 3.65 times per day to 1.88 times per day within a period of three months in breastfed infants (1). The defecation frequency typically ranges between two to eight times per day (6). It was shown that it decreases to 1.2 times per day with an associated increase in stool diameter (7,8). However, a group of breastfed infants defecates very infrequently, usually once for a couple of days to weeks. Among healthcare professionals this condition is referred to as 'constipation', 'pseudoconstipation', 'infrequent defecation', or 'infrequent bowel movements' (9). Children in this group had no other medical problems (10). These are normally fed, calm children who follow normal growth charts and who are free of additional problems (11). Although this condition is usually considered a normal and temporary condition, it is sometimes regarded as a pathological condition and the affected children are exposed to unnecessary tests and aggressive interventions. Children with this condition are sometimes prescribed intestinal motility agents or enemas, and they may undergo colon radiography, rectal manometry, or even rectal biopsy (9).

There is little information about infrequent stools (IS) in the literature. We therefore aimed to investigate the properties of children with this condition and monitor their clinical course. We opine that this study would be useful in promoting the awareness about infrequent stools among healthcare professionals and preventing unnecessary tests and treatments in such cases.

METHODS

The population of this retrospective cohort study included infants and children aged less than 6 months who presented or were referred to Etlik Zubeyde Hanim Gynecology and Obstetrics Training and Research Hospital, Pediatric Surgery Outpatient Clinic for the provisional diagnoses of constipation, lazy bowel syndrome, delayed defecation, and Hirschsprung's disease between January 2012 and December 2013. Each infant and child underwent a full medical and physical examination, and those children with organic causes for defecation problems (Hirschsprung's disease, imperforate anus, tethered spinal cord, cerebral palsy, hypothyroidism, etc.) were excluded. The subjects were required to meet the following criteria: 1) not having passed stools for two consecutive days or longer; our reason to select infants who did not pass stool for two days or longer is that parents usually consult a physician to get medical advice when their children do not pass stool for 2 consecutive days or longer. Furthermore, a child may normally pass stool for every two or three days without any difficulty, and this is not regarded as constipation (12). 2) being breastfed; 3) having painless and soft defecation. Additionally, they were required to have a normal physical examination; to pass meconium in time; to pass soft and yellow stools; and to be free of additional symptoms, difficulty passing stools, passing bloody stools, or any anal region problems. Infants and children who were fed formulas; who had shaped, hard, or bloody stools, abdominal swelling, or dyskinesia; and who had restlessness were excluded (Table I).

FOLLOW-UP and DATA COLLECTION

Follow-up information of the patients was either collected at hospital admission or by calling their parents or caretakers via telephone. The data included questions about the time of the passage of meconium; defecation frequency; stool consistency; stress and crying associated with defecation; having bloody stools or anal fissures; the age of onset and offset of IS's; laxative and enema use; past personal and family and medical history; and the developmental stages a child went through. Parents were asked to visit or recall the clinic, the clinical status of their child monthly, until the following period.

At these different ages, the number of time from presentation to the pediatric surgery clinic to follow-up was calculated and categories of follow-up periods were plotted. In addition, the follow-up of patients continued after the introduction of nutritional supplements or the elimination of IS's.

Definition of Clinical Outcome

The criterion of the elimination of infrequent stools was regular daily soft defecation.

Table I: Inclusion and exclusion criteria in the study.

Inclusion criteria	• not having passed stools for two consecutive days or longer • being breast fed • having painless defecation • normal physical examination • to pass meconium in time • to pass soft and yellow stools • to be free of additional symptoms • difficulty passing stools • passing bloody stools, or any anal region problems
Exclusion criteria	• organic causes for defecation problems (Hirschsprung's disease, imperforate anus, tethered spinal cord, cerebral palsy, hypothyroidism, etc.) • formula baby, shaped, hard, or bloody stools, abdominal swelling, or dyskinesia; restlessness

Statistical analysis

The statistical Package for the Social Sciences (SPSS/PC; SPSS Inc., Chicago, IL, U.S.A.) was used for statistical analyses. The study data were cross-sectionally analyzed. Descriptive statistics of the study data were provided. Nonparametric (Mann-Whitney U) and $\chi 2$ statistics were used to test differences for baseline characteristics between boys and girls. The following factors were examined: sex, birth weight and week, delivery type (vaginal route or cesarean birth), age of onset and ending of complaint, the duration of symptoms, and total duration of follow after passing symptoms. Also were examined age at which symptoms began, duration of first episodes of IS, maximum peak time of defecation (longest stool time of every infants), distribution of days of IS, the duration of all combined episodes of IS.

A value of $p<0.05$ was considered significant. The Pearson correlation coefficient r was used to evaluate correlation between frequency of defecation, and gestational age and birth weight. The relationship between age at the first episode of IS and the duration of IS was measured. The Pearson correlation test was performed because the data showed normal distribution.

Ethics committee approval

This study protocol was approved by the Ethics Committee of Etlik Zubeyde Hanim Maternity and Women's Health Training and Research Hospital.

RESULTS

Out of a total of 51 patients, 50 patients whose information could be accessed were included. The age range at admission was 2 to 180 days, with a median of 45.00±44.90 days. The female-to-male ratio was 1:1.08 (24:26). Forty infants were born via normal spontaneous vaginal route and 10 infants via Caesarean section. All infants passed meconium within the first 24 hours. The mean birth weight of the study subjects was 3179±539 gr (min-max: 1870-4210gr). The mean birth week was 38.63±1.66 (min-max: 34-42 weeks). Ten infants were prematurely born (34-36.6 weeks, 20%). In Table II shows baseline characteristics data of infants.

The median age at the first episode of IS was 43.50±39.21 days (range, 2 days-5.5 months), whereas the median age at the last episode of IS was 90±55.36 days (range, 20 days-9 months). The median duration of the first episode of IS was 4.7±1.59 days (range, 2-9.2 days) (%95 CI: 4.2-5.2), whereas the median duration of the maximum peak time defecation of each infants was 6.0±2.86 days (range, 2-16 days, %95 CI: 5.7-7.3). One infant passed stools two times for a month, who was very good, displayed no clinical signs of gastrointestinal or systemic disease and passed a vast soft stool at 15 and 16 days later at the end.

No significant difference was found between sex and the maximum mean peak time of defecation of all episodes ($p\leq0.054$). Maximum mean peak time of defecation in males was 5.02±1.51 days and in females it was 4.38±1.59 days. In infant we found a poor relationship between birth weight and IS (r=0.35), and between gestational age and IS (r=0.33). Infant birth weight or birth week is not a parameter that affects the condition of IS. There is also a low negative correlation between age at the first episode and the duration of IS (r=-, 014).

Table III shows Mann Whitney U test results of the duration of the all episodes of IS, age at the first episode of IS and time of at the duration of IS. There was no difference according to the gender. The duration of the all episodes IS: U=213,000, p>,05; age at the first episode of IS: U=258,500, p>,05; time of at the duration of IS: U=277,500, p>.05. Accordingly, it can be stated that the gender is not an important parameter of the duration of the all episodes IS, age at the first episode of IS and time of at the duration of IS.

Table IV shows Mann Whitney U test results of the duration of the all episodes IS, age at the first episode of IS and time of at the duration of IS. There was no difference according to the gestational age. The duration of the all episodes IS: U=199,000, p>.05; age at the first episode of IS: U=177,000, p>.05; time of at the duration of IS: U=159,000, p>.05. Accordingly, it can be stated that the gestational age is not an important parameter of

the duration of the all episodes IS, age at the first episode of IS and time of at the duration of IS.

The median duration of all combined episodes of IS was 2 months (range, 2 weeks-5.5 months) (%95 CI: 45.7-71.9). IS lasted for 2 months in 75% of the infants. The mean total follow-up time after passing of IS was 6.9±3.52 months (range, 2-15.5 months). During this period IS did not transform into frank constipation in any of them.

All infants' defecation habits returned to normal by the end of the follow-up. None of the infants had hard stools, and all of them had soft, yellow, and voluminous stools. Sixteen patients were begun on supplemental nutrition during follow-up. Fourteen (28%) infants who contacted us first were just followed, and did not undergo any test or were not administered any treatment. Of the remaining 36 children, before the study entry, 7 (19.4%) were subjected to various tests: 2 infants underwent colon radiography and 5 underwent plain abdominal radiography. These patients were tested at outside centers

Table II: The characteristics of children with infrequent stools during the first 6 months of life at their admission to Pediatric Surgery Outpatient Clinic, and their duration of infrequent stools (n=50), IS-infrequent stool.

Age, mean, day	55.7 (2-180)
Gender, %	
Male	52
Female	48
Birth week, mean	38 (34-42)
Birth way, %	
Vaginal route	80
Caesarean section	20
Age of onset, median, day	48 (2-165)
Duration of the first episode of IS, median, day	4.7 (2-9.2)
Duration of the maximum peak time defecation, median, day	6 (2-16)
Duration of all combined episodes, median months	2
Follow-up time after elimination of IS, mean, (months)	6.9 (2-15.5)

Table III: Data for a gender-based comparison of the age at the onset and duration of infrequent stools, and the total duration of all infrequent stool episodes. No significant correlation was found between the specified time periods and gender (p>0.05). (n=50), IS-infrequent stool.

	Gender	n	Mean Rank	Sum of Ranks	U	p
Age at the first episode of IS	Female	24	23.27	558.50	258.500	.298
	Male	26	27.56	716.50		
Time of at the duration of IS	Female	24	24.06	577.50	277.500	.498
	Male	26	26.83	697.50		
Duration of the all episodes IS	Female	24	29.63	711.00	213.000	.054
	Male	26	21.69	564.00		

Table IV: Data for a gestational age-based comparison of the age at the onset and duration of infrequent stools, and the total duration of all infrequent stool episodes. No significant correlation was found between the specified time periods and gestational age (p >0.05).

		n	Mean Rank	Sum of Ranks	U	p
Duration of the all episodes IS	Premature	10	25.60	256.00	199.000	.981
	Mature	40	25.48	1019.00		
Age at the first episode of IS	Premature	10	27.80	278.00	177.000	.576
	Mature	40	24.93	997.00		
Time of at the duration of IS	Premature	10	21.40	214.00	159.000	.314
	Mature	40	26.53	1061.00		

and were found to have normal findings. However, they were referred to our center for having persisting problems. Some patients were administered various treatments for infrequent stools by either physicians or parents. The most common treatments applied for the infants (because there are several possibilities for the same infant, the total exceeds 100%) were as follows: (1) intestinal motility stimulants (domperidone) and anti-gas medications (simethicone), n=6 (16.6%); (2) laxatives (lactulose), n=5 (13.8%); rectal suppositories (glycerin) and/or enema (sodium phosphate), n=17 (47.2%); (3) formulas or alternative treatment methods (various plant oils, application of anal stimuli, or rectal soap, n=8 (22.4%). Table V presents the therapeutic interventions and diagnostic tests used before the study entry.

DISCUSSION

The present study assessed the clinical course of infants and children with IS's who presented with or were referred for constipation or suspected Hirschsprung's disease in the first days, weeks, or months of life.

The exact mechanism of infrequent stools is unknown. There is an insufficient literature information and awareness among physicians about this condition. To date, three views have been proposed for the mechanism of the condition. According to the first view, breast milk is easily digested and rapidly degraded in the stomach; hence it leaves a lower amount of pulp (13). It is also far more easily digested than cow milk (11), and the stools of breastfed infants contain many saccharolytic bacteria that degrade absorbable and non-absorbable sugars (14). The second view states that the digested breast milk may wait in the bowels before reaching rectum, which is explained by small bowel immaturity (15). The third view advocates that bowel movements and digestive pattern of each infant vary by breast milk content, which is directly affected by mother's nutritional habits (16).

Table V: Therapeutic interventions and diagnostic tests used before the study entry.

	Interventions and tests	Number of children (n)
1	Colon radiogram with contrast	2
2	Upright plain abdominal radiogram	5
3	Oral motility stimulants and anti-gas medications	6
4	Oral Laxatives	5
5	Supplemental formulas	7
6	Rectal suppositories	17
7	Oral olive oil	8
8	Rectal stimulation	7
9	Anal soap placement	3
10	Oral apple oil	1
11	Oral almond oil	1

The distinction of IS's from constipation is important. According to the Rome criteria, the diagnosis of constipation requires the simultaneous presence of at least two of the following symptoms: scybalous, pebble-like, hard stools for a majority of stools; or hard stools ≤2 times/week; and no evidence of structural, endocrine, or metabolic disease (17). Defecation problems is the major symptom of 3% of outpatient pediatric cases and 10-25% of patients presenting to gastroenterology clinics (17). Loening-Baucke (7) found a constipation prevalence of 2.9% among children under 1 year of age. The prevalence of the condition has been reported to be 10.1% among children aged between 1 and 2 years, which is fairly higher than what has reported for children under 1 year of age. Late defecation or constipation is a special condition at the early periods of life, raising the possibility of many congenital disorders (7). Among these, the Hirschsprung's disease is the first that comes to mind. Therefore, infants and children having late defecation are usually referred to a pediatric surgeon for an evaluation of a surgical problem. Accordingly, many of our patients were referred to our clinic with the same provisional diagnoses.

The scarcity of studies investigating IS's in the literature made it difficult to compare our results with those of previous studies. We came across three studies on infrequent stools (9-11). Courdent et al. (9) conducted a similar study with ours, in which they applied a questionnaire to mothers of infants with IS's. They found an infrequent stool rate of 37% among breastfed infants. Unlike our study, however, they enrolled infants who did not defecate for one day or longer. The authors reported that IS's started at 10 days of age at the earliest and continued until the end of 8th month. The median duration of an episode of infrequent stools was less than 1 week, with the maximum duration being 4 weeks. The median duration of all combined episodes of IS's was 2.5 months with a maximum of 8 months. In our study, IS's started at the second day of life at the earliest. Defecation became sparser after meconium passage started and meconium was completely eliminated. This condition continued for about 7-8 months in some children. The defecation frequency was every two days at the shortest and 16 days at the longest. Episodes of infrequent stools disappeared by 2 weeks at the shortest and 5.5 months at the longest.

Choe et al. (11) studied 34 breastfed infants aged less than 6 months who had IS's. No organic abnormality was found in 28 out of 34 study participants. A rectoanal inhibitor reflex study was performed in some patients, and others underwent a barium radiogram and even a rectal biopsy. None of the children developed nutritional problems, nor did they show signs of fecal retention in the rectum or anus. Hirschsprung's disease was specifically considered as a diagnostic possibility in these children but it was not diagnosed in any of them. No treatment was administered to any of the study participants,

and they were only regularly monitored. The mean age at onset of the constipation was 1.9 months (0.5-3.5 months), and the condition spontaneously resolved at a mean age of 3.9 months (range 1-7 months). The authors concluded that this condition is innocent in children, and it may be easily detected by patient history and a careful physical examination, without necessitating aggressive diagnostic and therapeutic modalities (11).

Eggermont (10) also mentioned IS's and stressed that, as a rule, the affected patients are happy infants that closely follow growth charts. The author stated that parents of infants who have IS's should be informed about the condition in order to give them assurance and to prevent unnecessary interventions. Explaining the temporary nature of the condition may reduce hospital visits. He also pointed that such an effort would help save other children from procedural complications. This is because the author himself witnessed a rectal biopsy procedure in an infant with IS's who subsequently developed peritonitis and shock; later on, the child developed motor sequelae and mild mental retardation.

None of our patients underwent rectal biopsy although some of them had colon radiograms with contrast and some others upright plain abdominal radiogram. Many parents are considerably upset with their infants' infrequent stools. They just could not get rid of the idea that their children are sick. Among parents, the perception that an infant should pass stool every day is very common. Some of our patients were also subjected to aggressive olive oil treatment. Stimulation of anal canal with suppositories, soap, or thermometer is the most common intervention performed by parents or relatives, which may directly cause anal fissure development. To overcome their anxiety, physicians should be continuously in contact with parents of these children.

Our study indicated that some tests were applied to children with IS's. These included colon radiogram with contrast or plain abdominal radiogram for 14% of patients, and the use of anal suppositories, motility stimulants, or laxatives for 56%. Furthermore, 14% of the patients were administered formulas. These children were also treated by various methods that are popular among lay people, such as the application of anal suppositories, administration of olive oil, almond oil, or apple oil, stimulation of the anus, and soap placement in the anus. One infant was prematurely introduced supplemental nutrition. Nevertheless, these interventions were not beneficial and did not change the defecation frequency. Only 14 infants were monitored without any intervention.

As one can see, 78% of the infants with infrequent stools are exposed to unnecessary tests and interventions. Our primary objective is to draw attention to this subject to increase awareness.

Limitations paragraph

A drawback of this study is that the data were collected retrospectively. This study has some limitations. First, these children were selected and referred from primary care; therefore, it is not clear how many were the children unselected with the same condition. Second, many children in our series were tested and treated by various methods before coming into our attention, potentially altering the primary clinical picture. Third, our study lacked a control group. It would be scientifically more accurate to make a comparison with a group that was referred with the same provisional diagnosis by ultimately diagnosed with true constipation. In previous studies exploring the defecation frequency of infants and children the subjects were followed from the birth for a certain period (6,15,16,18). In our study, on the other hand, some patients were referred from other centers although some were still followed right from birth. Hence, it was impossible to determine the true prevalence of the condition in this population.

Previous studies on infrequent stools have either had a small sample volume or a short follow-up time. The strength of our study was that it maintained patient monitoring well after their condition was eliminated so that it could ascertain that infrequent stools did not result in constipation.

CONCLUSION

In conclusion, infrequent stools were completely eliminated in all the affected children and did not transform into frank constipation in any of them. We would like to stress that infrequent stools are a temporary condition requiring no treatment in infants and children who are well fed, who gain adequate weight, and who are free of abdominal swelling and hard stools. Taking a detailed history and a careful physical examination are sufficient to pick up patients with infrequent stools. We are of the opinion that this knowledge would be of great benefit for pediatricians, pediatric surgeons, and physicians and nurses working in the field.

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