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The effect of early feeding after enema reduction of intussusception in order to investigate the rate of recurrence and side effects of reduction.

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Abstract

This study has been done to investigate the effect of early feeding after saline enema reduction of intussusceptions on its side effects and recurrence rate at Children's Medical Center from 2012 to 2013. The study population consist of all patients with intussusceptions who admitted to Children's Hospital Medical Center from 2012 to 2013. Then, all these patients were divided randomly with block randomization method in quaternary blocks and non-blind into two groups: case group (early onset of feeding) and control group (fed with late onset). Members of the case group were hospitalized at least 24 h and were fasting for longer than 2 h. While in the control group, patients were just observed for a few hours after reduction and started to feed 2 hours after consciousness. After discharging from hospital, a pamphlet was given to each family's patient containing information about intussusceptions. Locations of intussusceptions were at the ileocolic and the small bowel for 85 (94%) and 5 (6%) patients, respectively. Recurrence was reported for 2 (4%) people in the case group and 7 (16%) people in the control group which had no significant difference (P=0.45). No side effects were reported in any of patients during follow-up. It appears that using saline enema reduction of intussusceptions in children who started feeding early is safe, convenient, non-invasive, with minimal recurrence rates and side effects.

Keywords: Intussusception, Enema, Feeding, Bowel, Ileum.

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Introduction

Intussusception is the most prevalent reason of small bowel obstruction in children younger than 2 years [1]. This condition is arisen, often near the ileocecal valve, by invagination one part of the bowel (intussusceptum) into a distal part (intussuscipiens). So, an intestinal obstruction develops because of a venous congestion. The incidence of intussusception has steadily increased all around the world. However, the vast majority of symptomatic intussusceptions in children develop in the first year of life [2-4], especially in 5- to 7-month-old children. The disease which has been reported in the UK is 1.6-4 cases per 1000 live births, and it is slightly more common in boys, with a boy to girl ratio of 3:2 [5]. Manifestation of intestinal obstruction usually correlated with nonspecific wide range of symptoms such as nausea, vomiting, pain, irritation and loss of appetite. Specific symptoms include blood in the stool and presence or absence of a mass which make a problem for clinical diagnosis of intestinal obstruction [6,7]. This condition implicates very urgent reduction in order to suppress probable damages such as ischemia and perforation of the bowel wall. Although most intussusceptions are ileocolic, colocolic and ileo-ileal intussusceptions also occur [5]. There are other types of intussusceptions that some of them may be asymptomatic or diminish spontaneously, also, the others may be occur since a pathologic lead points or gastrojejunostomy tubes [8]. A simple abdominal radiograph may represent severe proof of intestinal obstruction. This method has a sensitivity of over 98% and a specificity of 100% when looking for ileocolic or colocolic intussusceptions, while not enough sufficient for detecting an ileo-ileal intussusception [5]. Some other methods are used to detect intussusception, such as sonography or by contrast enema examinations of the colon [7]. In addition, laparotomy is done in the case of failure to reduce the intussusception at air/saline-reduction enema. Some surgeons prefer a laparotomy for children over 2.5–3 years old or in those with recurrent intussusceptions before an attempt to reduce intussusception with enema reduction. Whereas, enema reduction has less morbidity and much less cost in comparison with an operation [9]. The probability of recurrent and early recurrent intussusceptions at 24 first hours with enema reduction is about 10% and 0-5.3%, respectively [10,11]. Time of feeding is one of the important parameters which is done either early or late (2 to 12 h) after enema reduction of intussusceptions. Based on the time of feeding, there are some assumption about the manifestation of side effects of reduction, include bowel perforation, shock and sepsis [12,13]. However, there is limited evidence about the effect of fasting after the reduction in the incidence of intussusceptions recurrence. As a result, this study has been done with considering the increasing prevalence of intussusceptions in children, reducing the use of invasive surgical procedure, reducing the rate of mortality and

morbidity, decreasing patient cost, and accelerating the recovery time in order to investigate the effect of early feeding after saline enema reduction of intussusceptions on its side effects and recurrence rate at Children's Medical Center from 2012 to 2013.

Materials and Methods

Sampling population

The study population consist of all patients with intussusceptions who admitted to Children's Hospital Medical Center from 2012 to 2013. Some subjects were excluded from this study because of no definitive proof of intussusceptions, systemic diseases (lymphoma, Cystic fibrosis and Henoch-Schonlein), having lead point and high blood cells at admission time, continued abdominal pain after the enema reduction, being signed more than 24 h before enema reduction, the radiologist's report for integration of intussusceptions difficulty and the lack of consent of their parents for children to participate in the projects. So, a total of 90 patients selected sequentially: 40 (44%) girls and 50 (56%) boys, between the range of 0 to 17-year old. Also, the study was carried out in accordance with the Declaration of Helsinki and the consent of their parents was given for children to participate in this project.

Data source

After the enema reduction, patients were evaluated to make sure there was neither difficulty in integration of intussusceptions nor any side effects. Then, all these patients were divided randomly with block randomization method in quaternary blocks and non-blind into two groups: case group (early onset of feeding) and control group (fed with late onset). The sample size of each group was determined about 45 members based on the study of Ming et al. [14]. Members of the case group were hospitalized at least 24 h and were fasting for longer than 2 h. While in the control group, patients were just observed for a few hours after reduction and started to feed 2 hours after consciousness. After discharging from hospital, a pamphlet was given to each family's patient containing information about intussusceptions. Additionally, time of the next referral was announced to them (24 h of discharge, the end of the first week and the end of the third month after discharge). Then, the data were recorded on prepared forms.

Statistical analysis

Required data which given by interviews and completing the questionnaire were analysed using SPSS statistical software, version 10 (SPSS, Inc., Chicago, IL). To analyse the data, quantitative variables such as age and frequency of the qualitative data such as sex were calculated. Furthermore, comparing the qualitative variables and quantitative variables between the two groups was performed by Chi-square test and t-test, respectively.

Result

In this study 90 patients were evaluated, 45 patients (50%) in the case group (feeding less than 2 hours) and 45 patients (50%) in the control group (feeding more than 2 h equally. The mean age of the patients was 8.20 ± 4.4 (3-120) months. Locations of intussusceptions were at the ileocolic and the small bowel for 85 (94%) and 5 (6%) patients, respectively. Recurrence was reported for 2 (4%) people in the case group and 7 (16%) people in the control group which had no significant difference (P=0.45). Comparing demographic data was shown in Table 1 between the two groups.

Table 1. *Comparison of demographic variables in two groups of case and control*[a].

Variable	Case	Control	P value
Age, month			0.796
Younger than 6	1 (2.2)	2 (4.5)	
Between 6 and 11	15 (35.5)	18 (40)	
Between 12 and 23	15 (33.3)	12 (26.5)	
Between 24 and 35	8 (17.8)	9 (20)	
Between 36 and48	3 (6.7)	2 (4.5)	
Older than 48	2 (4.5)	2 (4.5)	
Gender			0.0803
Girl	10 (2.2)	15 (33.3)	
Boy	35 (77.8)	30 (66.7)	

[a]Data is presented as number (%). *Chi-square test. **P<0.05 is significant.

Comparison of clinical symptoms between the two groups was shown in Table 2. No side effects were reported in any of patients during follow-up.

Table 2. *Comparison of clinical symptoms between the two groups of case and control*[a].

Clinical symptoms	Case	Control	P-value
Severe and intermittent abdominal pain			0.38
yes	24 (52.3)	28 (62.2)	
No	21 (46.7)	17 (37.8)	
Vomit			0.512
Yes	22 (48.9)	23 (51.1)	
No	23 (51.1)	22 (48.9)	
Bloody stools			0.621
Yes	20 (44.4)	22 (48.9)	
No	25 (55.6)	23 (51.1)	
Vomiting bile			0.828
Yes	4 (8.9)	6 (13.3)	

No	41 (91.1)	39 (86.7)	
Jelly stools			0.971
Yes	5 (11.1)	4 (8.9)	
No	40 (88.9)	41 (91.1)	
Fever			0.515
Yes	4 (8.9)	6 (13.3)	
No	41 (91.1)	39 (86.7)	
Length of hospital stay after reduction, h	3.5	9	0.328

[a]Data is presented as number (%).*Chi-square test. **P<0.05 is significant.

Discussion

Time of feeding is one of the most important parameters which is done either early or late (2-12 h) after enema reduction of intussusceptions. Based on the time of feeding, there are various assumption about the manifestation of side effects of reduction, include bowel perforation, hypovolemic shock and sepsis. In most hospitals, a standard method known as enema reduction of intussusceptions is used due to reduced morbidity, hospital costs and short hospital stay for children [15]. Furthermore, it has been suggested to prevent probable side effects or recurrence of intussusceptions reduction, patients kept observed 48 h after reduction. [10]. In another research, it has been recommended a 24 h watch up to prevent the occurrence of hypovolemic shock after reduction [13]. In the present study, patients, which fed less than 2 h after reduction, showed the lower recurrence rate and no side effect. This result is confirmed by other studies that early feeding of patients does not take a risk for recurrence and after effect [16-18]. Francis et al. reported that patients who started feeding 2 h after reduction did not represent any recurrence [19]. Frances et al. was investigated the difference between the early start (less than 2 h) or late start (more than or equal to 2 h) after radiologic reduction of intussusceptions. The mean duration of stay for group began early feeding was 6.15 h. On the other hand, average time of being at hospital for the other group began late feeding was 1.16 h. There was reported no fever, abdominal pain or vomiting for the both group after reduction of intussusceptions. While, the rate of recurrence was higher for the group began late feeding (15%), than those fed lately (8%) [20]. Overall, the recurrence rate in this study was 10% which is close to those reported in other studies (8-10%) after reduction [11,16-18]. Differences in recurrence rate in various studies could be due to various intussusceptions reduction. Additionally, based on this research, recurrence rate associated with early onset and late onset of nutritional feed after enema reduction were 4% and 16%, respectively which is confirmed by other studies [21-25]. In addition, in this study, no complications related to the enema reduction of intussusceptions were reported, probably due to less invasive reduction and low sample size. While in other investigations, perforation of the bowel walls from 0.14% to 0.4% was reported, because of the presence of more samples [26-28]. Besides, length of hospital stay was shorter in patients who had early oral feeding. This study has been done because of considering the increasing prevalence of intussusceptions in children, reducing the use of invasive surgical procedure, reducing the rate of mortality and morbidity, decreasing patient cost, and accelerating the recovery time. According to the results obtained in this study, it appears that using saline enema reduction of intussusceptions in children who started feeding early is safe, convenient, non-invasive, with minimal recurrence rates and side effects. Finally, it has been strongly recommended to paediatricians that consider the early feeding for children after enema reduction of intussusceptions in order to decrease the rate of complication and recurrence.

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