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The Relatıonshıp Between Age, Sex, Applıcatıon Tıme And Morbıdıty In Intussusceptıon

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ABSTRACT: Introduction/Aim: Intussusception has high morbidity and mortality if not diagnosed and treated early. The aim of this study was to determine the relationship between age, sex, admission time and morbidity in patients with intussusception.

Materials / Methods: The records of patients who were operated with the diagnosis of invagination between January 2013-2019 were evaluated retrospectively.

Results: During the six-year period, 16 female(31.4%) and 34 male(66.7%) of total 51patients were operated due to intussusception. The mean age was 24.8months(1month-16years), and the mean age of 31patients(%60.8) was 1-year/younger 8±2.88months(1month-12months).

Abdominal pain in 40(78.4%), vomiting in 30(58.8%), rectal bleeding in 24(47.1%) were present on admission. The mean duration of onset of symptoms was 1.45days(1-5 days), the frequency of admission was 19.6% and 15.7% in June and March, respectively. The intussusception mass was palpated in 20(39.2%).

Ileocolic 44(86.3%), ileoileal 5(9.8%), colocolic 1(2%), jejunoileal 1(2%) were determinated during operations; the mean length of invaginated segment was 85mm(14mm-400mm). Two(3.9%) had Meckel's diverticulum. Manual reduction was performed in 40(78.4%). They were discharged on average 5.25days(2days-17days) postoperatively.There was no recurrence of intussusception/mortality. Postoperatif follow-up was uneventful in 45 pateints.

Intestinal perforation(1), Bride ileus(1), Wound infection(1), Early abdominal pain(2), Terminal ileum thickening(1) developed in patients. The mean duration of admission was 1.33days for morbid patients and 1.47days for non-morbid patients.

Conclusion: Early admission and diagnosis are known to reduce morbidity and mortality intussusception; in our study, no significant difference was found in the comparison of the mean admission time of patients between high morbid and non-morbid(p = 0.412).

Keywords: Child, intussusception, morbidity

I. INTRODUCTION/AIM

Invagination; It is the telescopic insertion of the proximal intestinal segment into a distal segment (1). It is an important cause of intestinal obstruction in the pediatric age group (2). It is widely thought that upper respiratory tract infection, adenovirus-associated gastroenteritis, and especially rotavirus vaccine and infection contribute to the etiology(3). If it is not diagnosed and treated early, it has high morbidity and mortality (4, 5). In this study, it was aimed to reveal the relationship between age, gender, time of admission and morbidity in cases with intussusception.

II. MATERIALS/METHODS

In our study, which was carried out in our clinic as a result of the approval of the ethics committee of our hospital, dated 18.09.2019 and decision number 83; Gender, age, symptoms at admission, duration of symptoms, frequency of admission by months, palpable abdominal mass on physical examination, type of intussusception during operation, length of invaginated segment, presence of additional pathology in the abdomen (Meckel's diverticulum). All data related to the operation (manual reduction, resection, anastomosis, spontaneous reduction), need for appendectomy, postoperative complications, and length of stay were evaluated retrospectively from the file records. The data were analyzed in the SPSS statistical program.

III. RESULTS

A total of 51 cases, 16 girls (31.4%) and 35 (68.6%) boys, were operated for invagination in a six-year period. The mean age was 24.8 months (1 month-16 years) and 31 (The mean age of the case was 60.8%, 8±2.88 months (1 month-12 months).

Abdominal pain was present in 40 (78.4%), bile vomit in 30 (58.8%) and rectal

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bleeding in 24 (47.1%) cases at admission. The mean time of onset of symptoms was 1.45 days (1-5 days), and the frequency of admission was highest in June and March (19.6%, 15.7%, respectively). 1 January, 4 February, 8 March, 2 April, 5 May, 10 June, 2 July, 3 August, 5 September, 4 patients were admitted to the outpatient clinic. They had applied in October, 2 November and 5 December; 29% were in spring, 29% in summer, 22% in autumn, 20% in winter.

In 20 (39.2%) invagination masses were palpable.

Type of intussusception in the operation; There were 44 ileocolic (86.3%), ileoileal 5 (9.8%), colocolic 1 (2%), jejunoileal 1 (2%) intussusceptions, and the mean length of the invaginated segment was 85mm (14mm - 400mm). Meckel's diverticulum was present in 2 (3.9%) patients. Manual reduction was performed in 40 (78.4%) patients during the operation, and spontaneous reduction was observed in 9 (17.6%) of the initial invagination. Appendectomy was required in 38 (.74.5%). Photographs of the operation are given in Pictures 1, 2, 3.

Perforation developed during reduction in two (3.9%) cases admitted on the 3rd and 1st day; The first case at 6 months of age did not have a leading point, and the second case at 16 years of age had LAP as a leading point. They were discharged on an average of 5 days (2nd-17th day) after surgery. Mortality or recurrence of early or late intussusception was not observed in any of the cases. Postoperative follow-up was uneventful in 45 (88.2%); 6 cases were morbid. Table 1 and Table 2 present the data distribution and characteristics of patients with morbid and non-morbid patients.

Of the 6 cases with morbidity, 5 were male and 1 was female. Ileocecal intussusception was detected in all cases with a morbid course and was treated with manual reduction. Appendectomy was required in only 1 case; however, simultaneous umbilical hernia repair was performed. In operation; None of the patients with a morbid course had additional intra-abdominal findings (such as Meckel's diverticulum). One patient had a lymph node as a leading point. The mean invagination length was 52.5±24.44mm (min:25mm-max:80mm) in morbid cases, but none of these cases had a palpable mass in the preoperative abdominal examination.

The mean age of the patients with a morbid course was 16±13.3 months (min: 6 months, max: 35 months). Abdominal pain was observed in all of the patients with a morbid course, while bile vomit was present in 83% and bloody stool was present in 33.3%. The mean time of onset of symptoms was 1.33±0.516 days (min:1day, max:2day) ago. The admission months of our morbid patients were mostly in the spring and summer months, as were the non-morbid patients. The mean hospitalization period of the patients with a morbid course was 6.17±5.42 days. The mean hospitalization period of the morbid cases was 6.17±5.42 days, and the mean hospitalization period of the non-morbid cases was 5.13±2.26 days (p=0.04).

In a 6-month-old male patient referred to us after unsuccessful pneumatic reduction in an external center, bowel perforation developed on the 3rd day after manual reduction. 2. In the operation, resection-anastomosis was performed. He was discharged on the 14th postoperative day. An 8-month-old male patient required an operation due to brid ileus 2.5 months later, and was discharged on the 3rd postoperative day after bridectomy. Wound infection developed in a 31-month-old female patient and healed within 9 days. Two 6-month and 10-month-old male patients required hospitalization and observation due to early period (within the first week) abdominal pain. They were discharged after 1 day and 4 days of medical follow-up, respectively. It took a long time (6 months) for the terminal ileum thickening of a 35-month-old male patient to recover in ultrasonic follow-ups. Table 3 shows the characteristics of patients with morbidity.

IV. DISCUSSION

Intussusception is the second most common cause of acute abdomen after appendicitis in childhood(3,6). The age range with the highest incidence is 4-10 months infants(7). Children under the age of one constitute 68-92% of the cases (6). In adults, only 1% of all causes of intestinal obstruction are due to intussusception(7). It is more common in men (1, 5, 6). In our study of 51 cases, gender distribution in 51 cases was found to be compatible with the literature. Although the mean age at admission is 24.8 months (1 month-16y), which is higher than the literature, we think that this difference is due to the fact that cases suitable for reduction are directed to centers where reduction can be performed, especially since there is no interventional radiology department in our hospital. However, the mean age of 31 (60.8%) cases one year old and younger was 8 ± 2.88 months (1 month-12 months) and it was found to be compatible with the literature.

Sudden onset, intermittent and severe abdominal pain, vomiting and rectal bleeding are the characteristic symptoms of palpable abdominal

mass intussusception (8, 9). Rectal bleeding in the form of "strawberry jelly" develops due to vascular stasis and mucosal damage in the affected intestine(8). On physical examination, patients are generally weak and dehydrated(7). A mass can be palpated in the transverse colon tracing in the right upper quadrant(7). Consistent with the literature, an intussusception mass was palpated in 39.2% of our cases in the preoperative period. While no mass was palpated preoperatively in any of the morbid cases, the mass was palpated in 44.4% of the non-morbid cases, and although this difference was statistically significant, the perioperatively measured mass size of the morbid patients was 80 mm, and the mass palpation revealed the age of the child and agitation status in the physical examination. It is thought that it may have been missed due to the reason and therefore it was found to be significant. Abdominal pain, vomiting, and bloody defecation (classic triple finding) have been reported at different rates in different series (4, 6, 7). In our study, abdominal pain was present in 78.4% of cases, biliary vomiting in 58.8%, and rectal bleeding in 47.1% of cases at admission. We are of the opinion that ultrasound (US) is a highly sensitive and frequently requested test in early diagnosis. The mean time to onset of symptoms was 1.45 (1-5 days) days. Our findings were compatible with the literature(3).

The two most important findings on direct abdominal X-rays used for diagnostic purposes are the target sign ("target sign") of compressed mesenteric adipose tissue surrounding the round soft tissue, and the half-moon shaped gas shadow image limiting the colon lumen at the top of the intussusception(6). Other non-specific findings are soft tissue mass in the upper quadrant at the border of the liver, empty right lower quadrant, air in the displaced appendix, and small bowel obstruction (6). However, the widespread use of US has pushed the use of direct abdominal X-rays for diagnostic purposes into the background(6). Findings of intussusception on US are visualization of soft tissue mass between 2.5 and 5 cm in diameter, target finding, multiple concentric ring finding, "pseudokidney" finding, and sandwich finding. The sensitivity of ultrasonography in the diagnosis of intussusception is 98-100%, its specificity is 88%, and its negative predictive value is 100%(1, 6). 90% of the cases in our series were diagnosed with US, and these rates were found to be compatible with the rates given in the literature(1, 6).

It has been reported that intussusception is a seasonal epidemic, with the first peak occurring in spring and summer due to enteritis, and less frequently in winter due to the abundance of respiratory tract infections(9). In our series, the highest number of admissions were detected in the spring and summer months, when gastroenteritis was intensely observed in both morbid and non-morbid patients; were highest in June and March, respectively.

In approximately 90% of the treated cases, the exact cause cannot be found and it is considered as idiopathic(10). 5-60% of idiopathic cases have a recent history of gastroenteritis or upper respiratory tract infection(9). Such a feature was not observed in our cases. There are publications stating that these infections may cause intussusception by causing lymphoid hyperplasia and mesenteric lymphadenopathy in the terminal ileum(9). As the age progresses, the incidence of Meckel's diverticulum, duplication cyst, and intestinal polyps, which are pathological leading points, increases(11, 12). In our study, 95% of the cases were evaluated as idiopathic, and these rates are among the rates reported in other series(9). Two patients (3.9%) had Meckel's diverticulum; In our cases, the rate of leading points was 41.2%, 16.7% in morbid patients, and 44.4% in non-morbid patients.

Although the most common type of intussusception is iliocolic intussusception, ileoileal and colocolic types can also be seen less frequently (1, 9). In iliocolic invaginations, the appendix may be affected secondary to compression; appendectomy can be done(5). In our study, the most common pathology was iliocolic intussusception, and simultaneous appendectomy was performed in 38 of our cases because they were affected by appendix compression.

While surgery was the only treatment method for intussusception until the 1970s, today 50% of the cases can be treated with non-surgical methods(1). The success rate of the non-surgical reduction method is low in children younger than three months or older than five years, whose symptoms started before 48 hours, blood flow from the rectum was determined, and signs of significant dehydration and small bowel obstruction were observed(1, 5). Non-surgical reduction methods are hydrostatic reduction with barium, pneumatic reduction with radioscopy, and hydrostatic reduction with saline under US guidance(1, 9). Since there is no interventional radiology department in our hospital, cases suitable for reduction are directed to centers where reduction can be made; Patients who underwent surgical manual reduction were included in our study.

While intussusception is a disease that can be treated with minimally invasive methods when diagnosed early, complications such as bowel

resection and sepsis may develop in cases diagnosed late(5). Bowel resection was required in 2 cases with a history of late presentation in our clinic. Success in the treatment of intussusception is possible with early diagnosis and early treatment; This requires full-time radiological support.

In one study, the hospital stay was 3.02±2.55 days in patients who underwent non-surgical reduction, and 5.93±2.01 days in those who underwent surgical reduction. The hospital stay was even longer in patients who underwent surgery because pneumatic reduction was unsuccessful(1). In another study with a total of 694 cases, patients were discharged on the 5th postoperative day(4). In our study, the patients who were treated surgically were discharged on an average of the 5th day (2nd-17th day) after surgery, in line with the literature. In our study, a significant difference was found between the length of stay of patients with a morbid course and those who did not.

In studies from developed countries, mortality caused by acute intussusception is rare in infants(9). Historical studies show a consistent improvement in mortality rates over the last 30 years in relation to early and advanced diagnosis and transition to non-surgical hydrostatic reduction techniques(9). Mortality, which is directly related to intussusception and its treatment, is disproportionately high in developing countries(9).

Patients from developing countries tend to present later, that is, 24 hours after the onset of symptoms, and this is associated with a higher resection rate and mortality(9). In a study of 694 cases, the mortality rate was found to be 1%(4), 4 patients died due to sepsis and 3 patients died secondary to anastomotic leakage. In another study of 26 cases, the mortality was 7.69%, and one patient was due to sepsis after bridectomy and the other was lost on the first postoperative day with symptoms of severe electrolyte imbalance and confusion (5). In a study of 81 cases, no mortality or morbidity was observed(3). In our study, no mortality or recurrence of early intussusception was observed in any of the cases; however, 11.8% of the cases were morbid. 6 of our cases were morbid. We had cases that required secondary operation due to bowel perforation and brid ileus, or who required hospitalization and observation due to wound infection or early period (within the first week) abdominal pain. In one case, recovery of terminal ileum thickening in ultrasonic follow-ups took a very long time, such as 6 months.

The mean admission time of the 6 patients with morbidity was 1.33±0.516 days, and the mean admission time of the non-morbid patients was 1.47±0.89 days.

V. CONCLUSION

It is known that early admission and early diagnosis reduce morbidity and mortality in intussusception, but in our study, no significant difference was found in the comparison of the mean admission time of our cases with high morbidity and those without morbidity (p=0.412).

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