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Review of 120 Cases of Intussusception among Infants and Young Children in Al-Qaim General Hospital

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ABSTRACT

Background: Intussusception is an emergency condition, mostly affecting the infants and toddler children and leads to small intestinal obstruction.
Objectives: To evaluate the presentation, management outcome and the benefit of early diagnosis and treatment.
Materials and methods: During the period (1986 to 2010), 120 patients with intussusception were retrospectively reviewed who they were admitted and followed up and treated in Al-Qaim General Hospital, Al-Anbar governorate, Iraq.
Results: There were 80 boys and 40 girls with a ratio of 2:1, ranging in age from 2 months to 7 years, 3/4 of them were $\leq$ 1 year with a peak incidence in spring and early winter. Eighty percent of patients presented within the first 24 hours. On presentation, the following symptoms and signs were vomiting (80%), colicky abdominal pain (75%), abdominal mass (70%), red currant jelly stool (70%). Classical presentation only found in 25% of patients. There were 26 patients with a positive family history. All patients diagnosed clinically and confirmed operatively in those whom operations were done for them. The basic treatment is a surgical reduction in 95% of cases, 3 patients treated by Barium enema reduction and the other 3 patients treated conservatively as cases of Henoch-Schonlien purpura. Sixteen patients (14.03%) needed bowel resection, due to late presentation. The mortality rate was 4.16% due to gangrene of bowel, bowel perforation, and electrolyte imbalance. The ileocolic site was the most common in (86.84%) patients and there were 2 recurrences.
Conclusion: In order to minimize morbidity and mortality from intussusception, steps must be taken to ensure earlier diagnosis and treatment.

Keywords: Intussusception; Infants; Children; Intestinal bstruction.

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INTRODUCTION

Intussusception is at the top of the list of the causes of upper bowel obstruction in the infants and early childhood. It carries disastrous complications and even death if it is not diagnosed early and treated in appropriate time [1]. Intussusception is defined as an infolding one segment within another neighboring part of the small bowel [2]. The incidence varies from 1−4/1000 live birth [2]. Between 70% and 95% of cases are classified as idiopathic, while the second type associated with other illness such as gastroenteritis or urinary tract infection, is found in about 30% [3], it is thought that pyre's patches hyperplasia of the last portion of the ileum may be the initiating cause. In light of the seasonal variation, the peak incidence is in spring and winter, it may be related to upper respiratory tract infection pathogens such as Adenovirus or Rotavirus [3]. A secondary type of the intussusception in children due to, for example Meckel's diverticulum, Henoch-Shoenlein purpura, polyp, and appendicitis are usually older than those with idiopathic type [3].

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Untreated intussusception in infants and children results usually in death, the cure rate is inversely proportional to the duration of illness, therefore when the reduction is earlier the outcome is better. The recurrence rate after reduction of intussusception is around 10% by using barium enema while it is about 2.5% by using surgical reduction [2].

Our goals were to registered the presentation and management outcome of intussusception and the importance of early diagnosis and treatment.

MATERIALS AND METHODS

The present retrospective research conducted in the Al-Qaim General Hospital at AL-Anbar Governorate, Iraq. The study approved by the scientific team of the hospital. Informed consent was not taken from the parents owing to the retrospective nature of the study. All consecutive subjects who meet the diagnostic certainty criteria of the Brighton Collaboration Working Group were enrolled in the present study during the period (1986−2010) [4]. Any patient with incomplete information in his or her case sheet was excluded from the study.

Teamwork cooperation was included pediatricians and general surgeons to diagnose these cases as early as possible, which was almost always depending on clinical presentation whether they were presented classically (classical abdominal pain, vomiting and blood in stool) or presented with a non-classical presentation and supported by surgical finding for those patients whom operated upon. The patients' data in their case sheets including date of presentation, age, gender, residency, symptoms and signs, duration of the presentation, family history, method of treatment (surgical vs conservative), surgeon's notes and outcome were reviewed by the authors.

Barium enema and ultrasound study were not regarded as a primary investigation. Plain abdominal X-Ray was done for all subjects as part of a routine investigation to diagnose intestinal obstruction. The data of our patients were analyzed using SPSS version 22 (Statistical Package for the Social Sciences). The results were presented in tables and figures.

RESULTS

We found that 66.7% (80) were males and 33.3% (40) females with a ratio of 2:1 Table 1. The range of the patients from 2 months to 7 years and the peak incidence was between (5 months to 12 months) as shown in Figure 1. Three-quarter of cases found to be ≤ 1 year of age and 1/4 of cases found to be above 1 year as shown in Table 1.

Only 25% (30 patients) presented with classical picture (classical abdominal pain, vomiting and blood in stool) Table 1. The frequency of symptoms and signs were: pain 75% (90), vomiting 80% (96), abdominal mass 70% (84), red currant jelly stool by rectal examination 70% (84), screaming 60% (72), blood in stool 25% (30) patients, abdominal distension 5% (6), lethargy 3.3% (4), purpural rash 2.5% (3), shock 2.5% (3) and diarrhea 1.65% (2) patients as shown in Figure 2.

Eighty percent (n=96) were presented at the first 24 hours while, 11.6% (n=14) presented within 48 hours, 6.6% (n=8) within 72 hours and 1.7% (n=2) presented for more than 72 hours Table 1.

There was 26 patient (21.3%) patients had a positive family history of intussusception, 4 families had 2 siblings, 4 families had 3 siblings of the same disease and 1 family had all their 4 siblings operated for intussusception. We found also 2 patients were second-degree relatives to one of our patient's Table 1.

Table 1. Characteristics of 120 cases with intussusception.

Variables	Number	Frequency%
Age		
≤ 1 year	90	75
> 1 year	30	25
Gender		
Male	80	66.7
Female	40	33.3
Presentation		
Classical	30	25
Non-classical	90	75
Duration		
< 24 hours	96	80
24−48 hours	14	11.7
48−72 hours	8	6.6
> 72 hours	2	1.7
Family history		
Positive		
2 siblings	8	6.7
3 siblings	12	10
4 siblings	4	3.3
Second-degree relatives	2	1.7
Negative	94	78.3
Cause of intussusception		
Idiopathic	115	95.8
Secondary	5	4.2

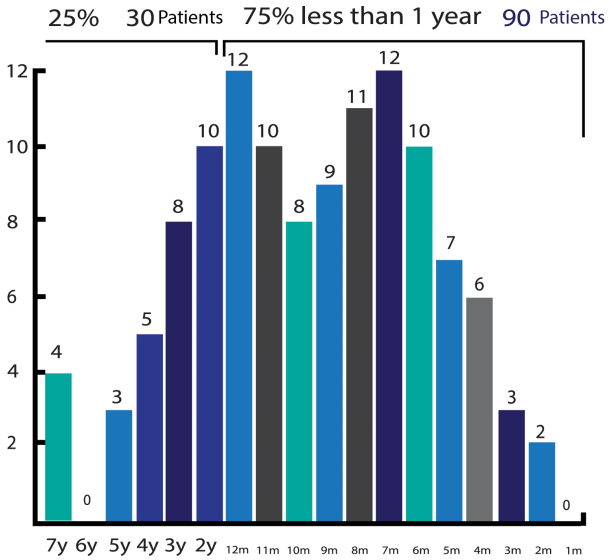

Figure 1. Age distribution of 120 cases with intussusception.

Seasonal variations showed distribution all over the months of the year but occur mainly at spring and early winter with a peak incidence in April and December as shown in Figure 3. Out of 120 patients, 114 patients (95%) were operated upon. While 3 patients (2.5%) treated with barium enema reduction and the other 3 patients (2.5%) were treated conservatively as cases of Henoch-Schonlien purpura as shown in Figure 4.

The commonest site involved was ileocolic 86.84% (99 pa-

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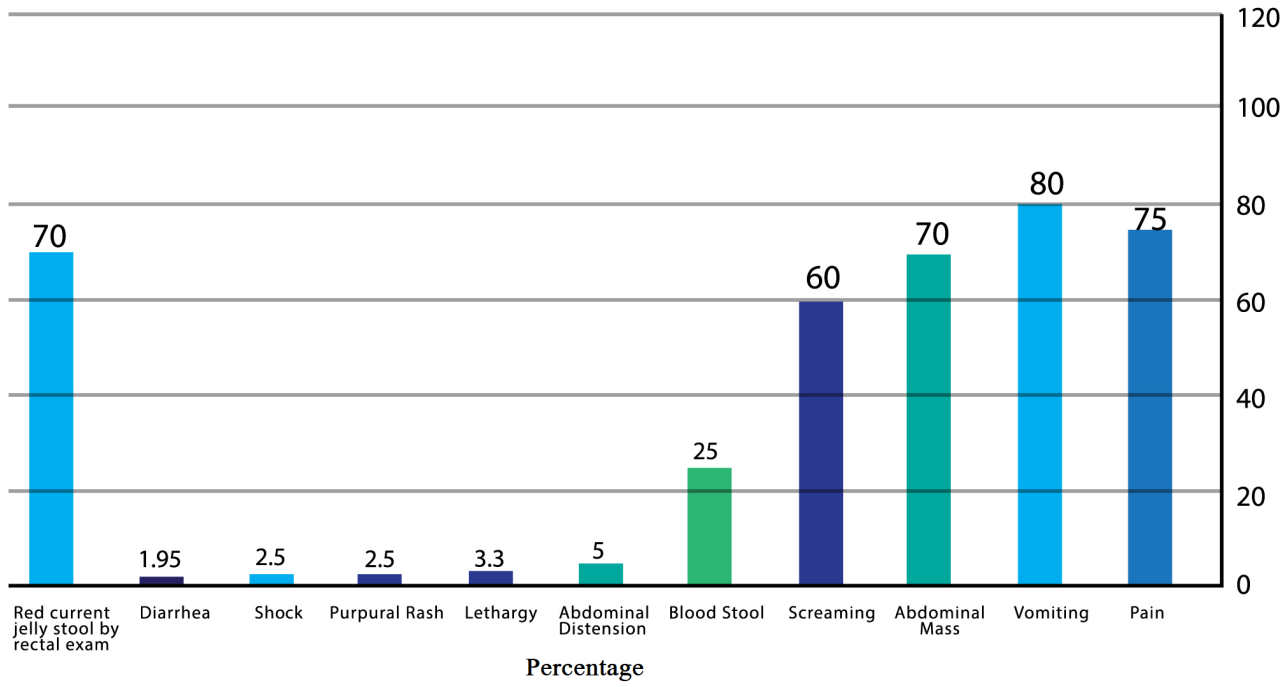

Figure 2. Symptoms and signs in 120 cases with intussusception.

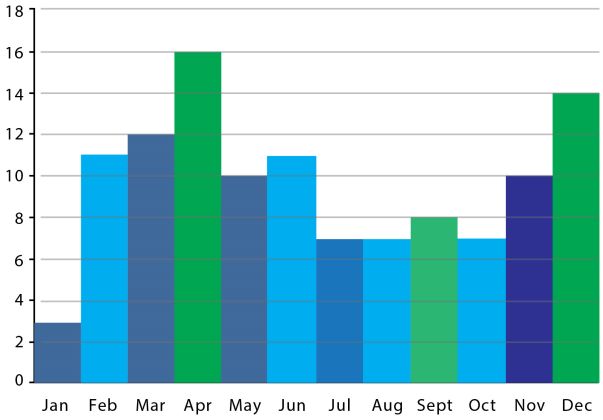

Figure 3. Distribution of 120 cases with intussusception according to the month.

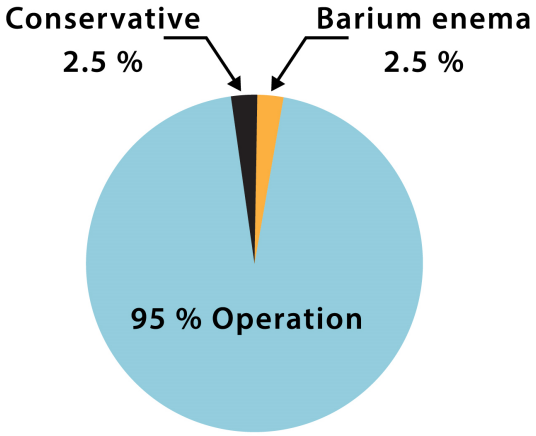

Figure 4. Shows the method of treatment of 120 cases with intussusception.

tients), while the other sites were 1 jejuno-ileal, 3 ileo-ileal, 5 colo-colic, 1 had 2 sites of intussusceptions at same time (1 ileo-ileal and 1 ileocolic separated by normal segment), and the other 5 patients were not stated the involved site Table 2.

The commonest cause of intussusception was idiopathic 115 patients (95.8%), while 5 patients found to have other causes (secondary): 3 Henoch-Schonlien purpura, and 2 Meckel's diverticulum Table 1. Out of 114 patients operated upon, 16 patients (14.03%) presented late and they needed bowel resection due to gangrene and a bowel perforation. The mortality rate was 4.16% (5 deaths). There were 2 recurrences in our study.

DISCUSSION

Intussusception is one of the most common causes of small bowel obstruction in infants and early childhood. The reported incidence of intussusception in 2000 infants was 1−4. The most common age group affected by this disease 3 months to 3 years. Early diagnosis and in time treatment prevents unwanted morbidity in the form of bowel gangrene and perforation and even mortality from these complications [5]. The present study revealed that 3/4 of our patients falls in an age of less than one year, which was similar to the previous studies [6–11]. Also, the study has close to previous results in the literature regarding the males to females ratio (2/1) [6, 8, 10].

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Table 2. Shows sites of the intussusceptions in 114 cases operated upon.

Site of intussusception	Number	Frequency%
Ileocolic	99	86.84
Colo-colic	5	4.38
Ileo-ileal	3	2.64
Jejuno-ileal	1	0.88
2 sites of intussusception	1	0.88
Not stated	5	4.38
Total	114	100

Intussusception presents with a peculiar early symptoms and signs including: severe colicky intermittent abdominal pain with screaming drawing up of the knees to the chest, pain, vomiting, screaming, blood in stool, abdominal mass which is usually detected in right upper quadrant of abdomen, red currant jelly stool by rectal examination, this study and many other studies reflect same clinical picture [6, 9, 10, 12, 13]. One quarter of our patients had the classical pictures (typical pain, vomiting, blood in stool and mass), this was near to previous 2 types of research [7, 12] and it was different from the study by Bode et al in Lagos in Nigeria that they found the pain in the abdomen, blood and mucoid in stool and abdominal mass (classical triad) are seen in 61% and this might be attributed to lengthening of the identifiable features mean duration of 3 days [1]. Other rare findings in our study were purpural rash in 3 patients who were diagnosed clinically as cases of Henoch Shoenlein purpura. However late features include: abdominal distension, bilious vomiting, and severe dehydration [14], the present study revealed abdominal distention 6, lethargy 4, and shock 3 patients, this reflects the late stage of the disease.

Early presentation and diagnosis of the intussusception are of utmost importance in the better management of this common emergency problem. Owing to early presentation in the present study (80% of patients were presented within the first 24 hours) and early diagnosis and intervention, the complication rate was low. This finding was similar to other studies [6, 8–10], while Kuruvilla from Trinidad elicited high misdiagnosis rate 55% lead to inappropriate and delay in management with high case fatality and complication rate [11], also Adejuyigbe from Nigeria reported only 2 patients out of 39 children presented within 24 hours and the rest of them carried a high bowel resection rate and high mortality [15].

Oshio et al study in Japan found up to the third-degree relatives suffer from intussusception and they concluded that hereditary predisposition such as an anatomical base may be considered as an aetiological factor for intussusception [16]. Mac Mahon described a tow siblings in each of the 8 families were diagnosed as intussusception [17]. In a study by Thomas et al, a 2 year identical twins were affected one and half day apart between them, both had Peyer's patches lymph nodes enlargement, an infection in the 2 infants might be the cause of the condition [18], Serour et al detected a 2 children from the same family affected by intussusception. And they observed that the experience of the parents with the problem due to affection of another member/s of the family leads to shortening of the time period between the onset of the disease features and final diagnosis of the case so enhancing in time intervention therapy [19]. The present study supports that the hereditary factor is a predisposing element in the pathogenesis of idiopathic intussusception.

The occurrence of intussusception in the present study showed variation in seasonal distribution all over the months, but occurs mainly in winter and spring with a peak incidence in April and December. The previous study elicited similar seasonal incidence [2]. Russel found a cause for seasonal variation, which may be attributed to upper respiratory tract infection agents like Rotavirus or Adenovirus [3]. But, Kim mentioned that there is no seasonal variation [10].

The diagnosis of the intussusception in the present study based mainly on clinical finding and proved surgically and this doesn't reflect all cases that have been treated during this period as many patients with intestinal obstruction treated conservatively, we also eliminate other causes of intestinal obstruction like foreign bodies, diverticulum or bands. Mangete et al in Nigeria on the study of 69 cases of intussusception, also the diagnosis was made clinically and confirmed at surgery [7]. The lack of radiological facilities and the absence of on round the clock radiologist, barium study and ultra-sound lead to the rarity of non-operative reduction in our study. Plain abdominal X-Ray was helpful only in the diagnosis of intestinal obstruction in the present study. The study by Shapkinaetal mentioned that conservative treatment by air enema was the standard technique in Russia and concluded that it is an effective and safe reduction option for early cases and carries an excellent cure rate, but the complications and even death are directly proportional to the duration of illness [8]. In our study surgical manual reduction was the main method of treatment which was carried out in the majority of our patients (95%), 3 patients treated with barium enema reduction because there was no anesthetist at that time and difficulty of referral we obliged to do so. The remaining 3 patients were treated conservatively as cases of Henoch-Shoenlein purpura. The study by Cranksonetal in KSA of 37 episodes of intussusception, in a 36 subjects, barium enema was resolved the condition in 20 patients (56%) and laparotomy required in 16 cases (9). The study by Dawod et. al in Qatar, they found that the overall success rate was 49% by barium hydrostatic enema and it was negligible after 24 hours of cardinal symptoms [6]. The non operative reduction was also carried out by Myllyla from Finland [12] and Kim YS et al from Korea [10] but not done by Adejuyigbe et al from Nigeria as most conditions need surgery and bowel resection, this attributed to the delay in seeking medical treatment [15].

Out of 114 patients with intussusception operated upon in, 16 patients (14.03%) presented late and needed bowel resection for gangrene and or bowel perforation that was different from the study by Bode from Nigeria with the finding of 70.4% bowel resection rate [1], also Adejuyigbe et al had 46% bowel resection [15].

In our study the ileocolic type of intussusception found in 99 patients (86.84%), this was similar to study by Cranksonetal in KSA [9] and Dawod et al in Qatar [6]. We found one patient had 2 intussusceptions at the same time (one ileo-ileal and other ileocolic separated by normal segment).

The mortality rate was 4.16% (5 deaths) for different reasons as gangrenous bowel, bowel perforation, electrolyte imbalance and sepsis, this rate seem to be smaller in comparison to Mangeteetal in Nigeria with 11.6% and Kuruvilla et al in Trinidad (6.4%) [11] and Adejugigbe from Nigeria with 23.1% mortality rate [15] that reflect delayed medical seek and misdiagnosis, some studies report no mortality like Dawod in Qatar et al [6] and Cranksonetal in KSA [10] studies.

There were only 2 recurrences in our study following surgi-

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cal reduction and they were re-operated while Cranksonetal in KSA [10] had a recurrence in 3 patients and 3 recurrences in Dawod et al study [6]. The low recurrence rate in the present study in comparison with a previous study [10] was related to the method of treatment (surgical reduction in this study vs barium enema reduction in the Kim et al study).

CONCLUSION

1. Early diagnosis and prompt treatment with cooperation between pediatricians and surgeons and all doctors with a high index of suspensions play an important role in reducing morbidly and mortality.
2. Hospital admission of any patient suspected to have clinical pictures of intussusception with close observation will reduce any misdiagnosis.
3. Medical condition like Henoch ShoenleinPurpura should not be forgotten.
4. Non-surgical reduction of intussusception especially in patients who presented within the first 24 hours with no signs of strangulation is very important and usual treatment in many hospitals but is not carried out in our hospital because of lack of facilities.
5. Family cases although genetically not proved but carry a high diagnostic value as parental experience shorten the period between symptoms and management.

RECOMMENDATION

1. To stress on close cooperation between all doctors in the primary health centers and specialist in hospital and between surgeons and pediatricians.
2. Improving radiological facilities for diagnostic and therapeutic purposes.
3. To encourage the non-operative reduction as it causes less morbidly and mortality.
4. We suggest further studies in our country and to investigate the familial and genetic predisposition.
5. Again and again, we stress on early diagnosis and management that will reduce the complications and even the death.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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