

## Etiologies of Intussusception in Atypical Age Group and Their Need for Biopsy

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### ABSTRACT

#### Objective

To determine the etiologies of intussusception in the atypical pediatric age group and their need for biopsy.

#### Methodology

This is a retrospective study done in the Department of Pediatric Surgery, Khyber Teaching hospital, from 1<sup>st</sup> January 2021 to 31<sup>st</sup> December 2021. 43 patients of either gender, 2-10 years old were included in the study with a diagnosis of intussusception confirmed with ultrasonography. Patients presenting at the typical age of 3 months to 24 months were excluded from the study. Age, gender, presenting complaints, clinical manifestation, and ultra-sonographic findings were recorded. The exact etiology of intussusception was confirmed by histopathology or per-op findings.

#### Results

The patients' mean age was 3.9±1 years. Total 26 male and 17 female patients with a male to female ratio of 1:0.6. Among the total 27 (62%) cases with identifiable pathologic lead point were identified. Lymphoma was the cause of intussusception in 13 patients (48%), Meckel's diverticulum in 8 patients (29%), Henoch-Schönlein purpura in 3 patients (11%) and intussusception after any abdominal surgery in 3 patients (11%).

#### Conclusion

Lymphoma remains the most usual cause of intussusception in the atypical age group in Pediatric surgery patients followed by Meckel's diverticulum.

**Key words:** Intussusception, Atypical age Group, Intestinal Biopsy

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### INTRODUCTION

Intussusception is highly prevalent reason of acute intestinal obstruction in infancy and early childhood with an incidence of 01 to 04 per 1000 live births.<sup>1,2</sup> It is described as the enfolding of one segment of the intestine into an adjacent segment of the bowel, and its peak occurrence occurs between the ages of 6 and 9 months.<sup>3,4</sup> Patients mostly present acutely with pain per abdomen, vomiting, and bleeding per rectum. Patients with intussusception due to pathological reasons mostly present with a long term symptoms and are usually older or sometimes younger than the typical age group of 03-24 months. Common clinical findings on physical examination include abdominal mass and tenderness. The best diagnostic imaging method for intussusception is ultrasound.<sup>4</sup>

Nonsurgical therapies for intussusception are successful consisting of hydrostatic or pneumatic pressure reduction.<sup>3,5</sup> Hartman solution or Saline enema is frequently used along with ultrasound guidance for hydrostatic reduction, while contrast enema is frequently used with fluoroscopic assistance.<sup>6</sup> Pneumatic reduction is carried out using room air, carbon dioxide, or oxygen

under ultrasound or fluoroscopic guidance.<sup>3</sup> However, if non-surgical therapies fails to reduce the intussusception or detect any malignancy or the patient is not stable, or if there are signs of peritonitis or gut perforation then operational intervention is warranted.<sup>2,7</sup> The low risk of perforation and the 70–85 percent success rate of non-operative reduction have all been demonstrated in several investigations. The typical age is 3 months to 24 months, with a descending incidence from two years of age. Whereas most of the cases of intussusception in the typical age group are idiopathic, cases in children beyond the typical age may have a pathologic lead point, with varied incidence from 3% to 20% depending on age and geographical stratification. Pathological causes include anatomic anomalies, infectious and noninfectious causes, congenital anomalies, and bowel wall defects.<sup>6</sup>

No studies have been conducted in Pakistan to determine the actual pathological cause behind this disease. The main aim of this study is to determine the common pathological causes of intussusception in the atypical age group at the pediatric surgery

This article may be cited as: Imran *et al.* Etiologies of Intussusception in Atypical Age Group and Their Need for Biopsy. *Adv Basic Med Sci.* 2022; 6(1): 12-15

unit.

## METHODOLOGY

This retrospective study was conducted at the Department of Pediatrics Surgery, Khyber Teaching Hospital, Peshawar. This study was conducted from 1<sup>st</sup> January 2021 to 31<sup>st</sup> December 2021, after taking ethical approval from hospital ethical committee (number). We included 43 patients in our study of both gender. The range of age was between 2-10 years with the diagnosis of intussusception confirmed using ultrasonography through convenience sampling. Patients presenting at the typical age of 3 months to 24 months were excluded from the study. These patients were received via the emergency department. Age, gender, patient's history, presenting complaints, clinical manifestation, and ultra-sonographic findings were recorded. The clinical examination was done by a consultant in pediatric surgery with at least 5 years of experience and all the related radiological procedures were reported by a senior consultant in radiology with at least 5 years of experience. The exact etiology of intussusception was confirmed by histopathology or per-op findings. Data was analyzed using SPSS version 26.

## RESULTS

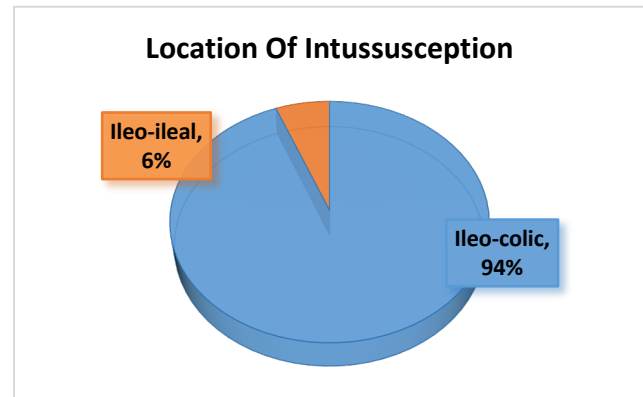
Of the total 43 patients, the mean age of the patients was  $3.9 \pm 1$  years. There were total 26 male and 17 female patients with a male to female ratio of 1:0.6. The majority of cases in our study had a pathologic lead point which in order of frequency were lymphomas (67.44%), Meckel's diverticulum (18.60%), Henoch Schnolein Purpura (6.97%) and post-laparotomy (6.97%). The cumulative frequency of these etiologies in 43 cases is 67.44% for lymphomas and 18.60% for Meckel's diverticula. The details of the descriptive parameters are presented in table 1, while figure 1 shows a pie graph indicating location of intussusception in terms of proportions.

Parameters	Values
Male patients	26 (60%)
Female patients	17 (40%)
Male to female ratio	1: 0.6
Mean age of the patient	$3.9 \pm 1$ year
Cases of spontaneous reduction	None

**Table 1** Descriptive statistics of various variables (n=43)

In around 67% of the patients the underlying cause of intussusception was found to be lymphoma (67%) while the remaining etiologies constituted relatively smaller fraction as shown in figure 2.

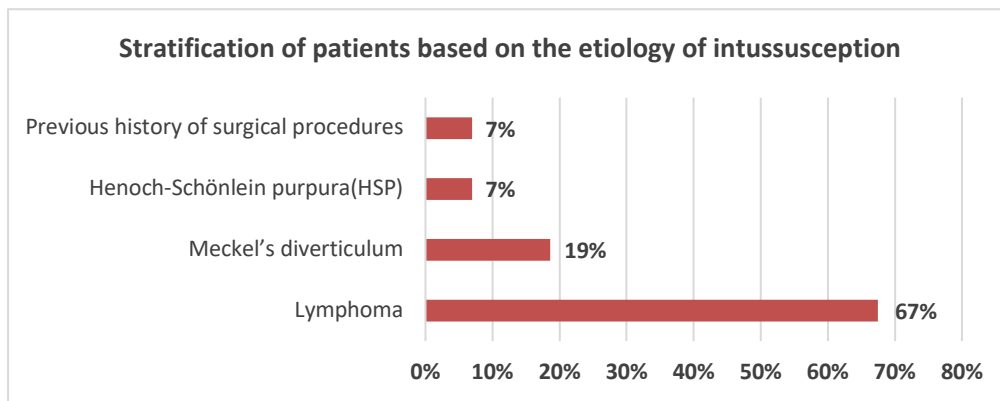
The great majority of patients reported severe intermittent pain as their chief complaint while only a few mentioned vomiting as seen in Figure 3.



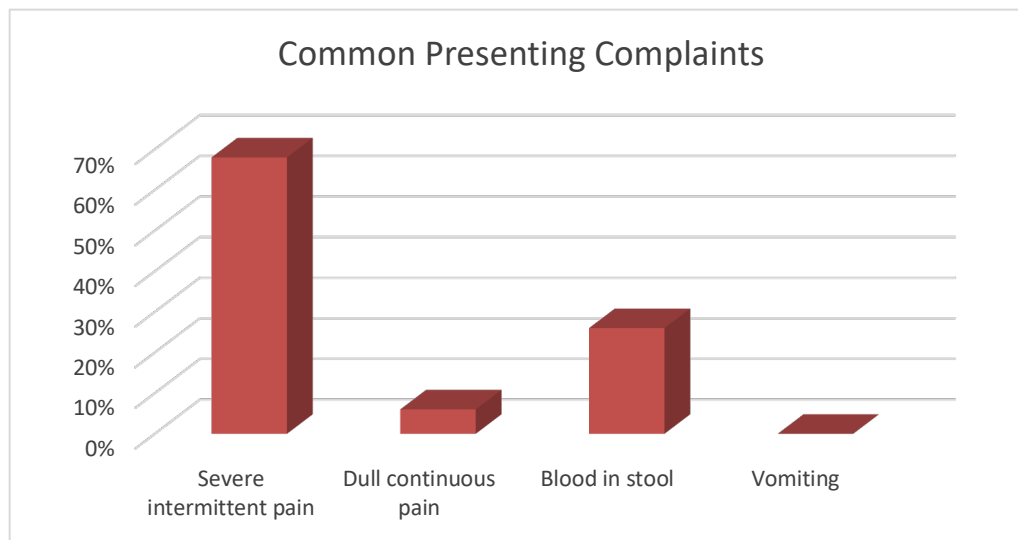
**Figure 1:** Location of Intussusception

## DISCUSSION

Our study comprised a total of 43 patients with 26 male patients and 17 female patients having a male to female ratio of 1:0.6. The male predominance of intussusception is well documented in many studies and our findings were in line with these studies.<sup>8</sup> In our study, 94% of cases had ileocolic intussusceptions while only 6 percent had ileo-ileal intussusceptions. Most of the published papers, report ileocolic as the most common type which is comparable to the findings of our study.<sup>9</sup> The mean age of the patient in our study was  $3.9 \pm 1$  years which tends to be on the higher end of the spectrum of the typical age of presentation because our study mainly focused on the atypical age group.<sup>10</sup> Intussusception in the atypical age group in our institution was seen at a rate of about 3-4 cases per month which is very high compared to the studies conducted worldwide.<sup>11</sup> The most common and reliable clinical presentation was severe intermittent and crampy abdominal pain. It was believed that persistent colicky abdominal pain in children of any age group is a case of intussusception until proved otherwise as indicated by *Fallis*.<sup>12</sup> *Demirkan A et. al.*, also reported intermittent, sharp, and crampy abdominal pain as the most common presentation in the atypical age group.<sup>13</sup> Similarly, blood in stool whether gross or occult was seen in 26% of patients which is in contrast to the findings of Turner.<sup>14</sup> We did not encounter any cases with presenting complaints of vomiting. Vomiting as a presenting complaint about intussusception is mostly seen in infants.<sup>15</sup> Spontaneous reduction of intussusception is reported in 10-20% of cases.<sup>16</sup> Some studies have reported an observation of spontaneous reduction of intussusception in some patients on the operating room table. This might be due to the relaxing effect of anesthetic drugs.<sup>17</sup> While other studies report a rate of even up to 82%, no patient in our study underwent spontaneous reduction.<sup>18</sup> In-hospital mortality in our study was 0% while studies have indicated a mortality rate of up to 2.5%.<sup>19</sup> In 37% of cases, the lead point wasn't identified and usually per op findings were consistent with mesenteric lymphadenopathy. This was confirmed by lymph node biopsy which showed reactive



**Figure 2.** Stratification of patients based on the etiology of intussusception



**Figure 3.** Common presenting complaints in patients presenting with intussusception

inflammation to pathogenic causes. The lead point of intussusception in our study was identified in 63% of cases based on biopsy or intraoperative findings with lymphoma being the most common i.e. 48% of all identifiable pathologic lead points, which is very high as compared to other studies.<sup>20</sup> Extensive patient series have showed that 6-17.5% of cases associated with lymphoma come up with symptomatic intussusception and have a 10 years median age at diagnosis. In our study median age for lymphoma was beyond 2 years.<sup>21</sup> Resection was attempted in the majority of cases and the diagnosis was confirmed on biopsy. In 3 cases resection was not possible surgically hence specimens for incisional biopsy were excised with bypass of the obstructed portion. Post surgically all patients were referred to an oncologist for further treatment.

Meckel's diverticulum was found to be the lead point of intussusceptions in 8 (19%) cases in our study population of atypical age group. This proportion is also very high as compared to other studies reporting up to 4% cases of intussusception because of Meckel's diverticulum.<sup>22</sup> Henoch-Schönlein purpura as the leading point for intussusception was identified in 3(6%) cases

Intussusception has been documented as the most common surgical complication of Henoch-Schönlein purpura (HSP) in childhood having a frequency of 0.7-13.6%.<sup>23,24</sup>

Also, we had 3(6%) patients with the previous history of laparotomy for other abdominal pathologies now presenting to us with symptoms of intussusception. All of them were ileo-ileal intussusception. Even though the incidence of intussusception secondary to abdominal surgery is very rare, some studies have reported an incidence of 2.8-7.4% which is comparable to our study.<sup>25</sup>

It is noteworthy to mention that this study was conducted in a tertiary care hospital and several cases were received from peripheral areas with most of them already operated for symptoms unspecified with no improvement in complaints. Management of such cases poses various challenges including diagnostic delays, difficult re-explorations, inability to perform image-guided or laparoscopic biopsies, and nutritional and financial unfitness for treatment.

Just like any other study, our study was not devoid of limitations. A key limitation of this study is that a database from a single

institution (one center) was used. Although different surgical teams compiled this study but this method limits the generalizability of our results. Also, the low sample size and lack of follow-up decrease the generalizability of our results. We recommend a multi-center study on this topic with large sample size and adequate follow of the patient for future studies.

## CONCLUSION

Intussusception with a pathologic lead point is not a very rare phenomenon. A high index of suspicion is needed in atypical age group children for malignancies as etiology of intussusception. A careful history, physical examination, and most importantly, per operative biopsy of intussusception/ draining mesenteric lymph nodes must be taken in all cases presenting beyond 2 years of age to rule out lymphomas.

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