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The Pattern and Management Outcome of Gastric and Intestinal Foreign Bodies in Children Seen at Muhimbili National Hospital

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Background: ***Finding an ingested sub-diaphragmatic foreign body in paediatrics is common and represents a considerable nervousness to parents. The vast majority is expelled uneventfully within one week of ingestion, however, sometimes can lead to complications and mortality. The purpose of this study was to explain the pattern of ingested gastric and intestinal foreign bodies, its management and outcomes in children at Muhimbili National Hospital.***
Methods: ***A prospective cross-sectional study was conducted in the paediatric surgery unit from April 2012 to October 2013 to children below 10 years of age using a structured questionnaire. Symptoms free children were discharged for observation at home and symptomatic children or with risky objects were planned to be cared in the hospital.***
Results: ***A total of 33 children were studied, Boys being 72.7% (24/33), M: F=2.7:1. The under 5-years were the majority (78.8%, 26/33). The commonest ingested foreign bodies were Coins (42.4%, 14/33), Nails (18.2%, 6/33) and screws (12.1%, 4/33). The mean length of ingested foreign bodies was 2.47 centimeters (±0.56 SD). The transient time was less than one week in the majority of children (90.9%, 30/33). The average transient time was 4.1±0.05 SD days. All children passed theirs foreign bodies under observation at home uneventfully.***
Conclusion: ***Foreign bodies risk of ingestion is high in under fives and conservative observational treatment is successful in the majority.***

Key words: Foreign body, paediatrics, gastric, intestinal, management, outcomes.

Introduction

Ingestion of a foreign body is a frequent condition occurring in the paediatric age group as children tend to explore objects by tasting and swallowing them[1,2]. It poses a great anxiety to parents[3,4]. Foreign body ingestion among children is usually accidental, the incidence is greatest in children aged between 6 months and 6 years[3,5,6] and equal amongst males and females[2,7,8].The majority of foreign bodies once they reach the stomach pass un eventfully through the rest of the gastrointestinal tract in 4 to 6 days[4,5,6]. However, some may be impacted, cause obstruction, bleeding and perforation and require immediate flexible endoscopic or surgical intervention[2,9]. Children ingest significantly different types of foreign bodies and the types of ingested foreign bodies differ by geographic regions and cultural practices[6,10]. This study was performed to explain the pattern, management and outcome of gastric and intestinal objects in paediatric and enlist areas of improving care in our environment.

Patients and Methods

This one and a half years prospective cross-sectional survey was done at Muhimbili National Hospital between April 2012 and October 2013 in children under 10 years of age (the upper age limit for paediatric surgery patients) with gastric and intestinal foreign bodies proven by history and abdominal x-ray who were seen at first in the Emergence department and referred to paediatric surgery unit for further care. All cases were reviewed and symptoms free children

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with less risky objects were discharged home immediately under conservative treatment (watch full waiting) until the exit of the foreign body while at home. Mobile phone follow up was applied to monitor the child progress every two days. However parents/Guardians were advised to observe for signs of complications like abdominal pain, fever, abdominal distention and bring back the child immediately to hospital if these symptoms develop. The plan for symptomatic patients or with highly risk objects like disc batteries or magnets, narcotic packets of illegal drugs and long sharp objects were to be followed and managed with laxatives or surgery if needed in the ward. Information collected included: Age, sex, parents telephone numbers, time and date of ingestion of a foreign body, clinical features, site of a foreign body in the gastric-intestinal tract at first x-ray, type, length and width of the foreign body, time and date of expel of a foreign body, complications, type of management and outcome, home address. Analysis of data using the computer statistical package SPSS version 20 was done and Fisher`s exact test was used to compare proportions. A P – value of ≤ 0.05 was considered statistically significant.

Results

During one and a half years, 33 children were studied. Males outnumbered females by being 72.7% (24/33) of the study population, M: F=2.7:1. Most of cases aged below 5 years (78.8%, 26/33) and the peak age was between 3 and 5 years (57.6%, 19/33). The mean age was 4.7±0.23 SD years with the range of 1.5 – 10 years (median 4.2 years). Coins (including 3 two hundred, 5 one hundred and 6 fifty shillings coins) was the most common ingested foreign body found in 42.4% (14/33) of cases followed by Nails (18.2%, 6/33) and screws (12.1%, 4/33), Table 1.

Table1. Foreign Bodies' Distribution by Age and Sex.

Type of foreign bodies	Age (Years)			Total (%)	Sex		Total (%)
	1-3 (%)	>3-5(%)	>5-10(%)		Males (%)	Females(%)	
coins	5(35.7)	7(50.0)	2(14.3)	14(42.4)	11(78.6)	3(21.4)	14(42.4)
Nails	1(16.7)	3(50.0)	2(33.3)	6(18.2)	5(83.3)	1(16.7)	6(18.2)
Screws	1(25.0)	3(75.0)	0(0.0)	4(12.1)	2(50.0)	2(50.0)	4(12.1)
Pins	0(0.0)	0(0.0)	3(100.0)	3(9.1)	1(33.3)	2(66.7)	3(9.1)
Metal bars	0(0.0)	2(100.0)	0(0.0)	2(6.1)	2(100.0)	0(0.0)	2(6.1)
Others	0(0.0)	4(100.0)	0(0.0)	4(12.1)	3(75)	1(25)	4(12.1)
Total	7(21.2)	19(57.6)	7(21.2)	33(100.0)	24(72.7)	9(27.3)	33(100.0)

ǂ. Others include: Necklace (1), piece of glass (1), Hook screw (1), Metal disc (1)
Fisher`s exact test 15.59, P=0.26 for the age
Fisher`s exact test 7.90, P =0.38 for sex

The median time between object ingestion and presentation to hospital was 6 hours (range 1-366 hours). Most of children presented to the hospital within 6 hours of ingestion of foreign body, 60.6 % (20/33) and all cases were symptoms less at presentation. There was no child with a previous history of gastro-intestinal surgery or co-morbidity and no child ingested more than one or one kind of objects. Most of the objects were in the stomach (54.5%, 18/33) at presentation, followed by small bowel (24.2%, 8/33), Table 2.

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The mean length of the ingested foreign bodies was 2.47 ±0.56 SD centimeters and the range was 1.5 to 4 centimeters, the width/thickness average was 0.2±0.07 SD centimeters ranging between 0.05 – 0.3 centimeters. The transient time (time between ingestion and exit of foreign body) was less than 7 days in the majority of children (90.9%, 30/33) with the peak transient time being from 1 to 3 days (63.6%, 21/33). Eight out of the 9 females passed their foreign bodies within 3 days of ingestion and this observation was statistically significant (P= 0.02), Table 3 . The average transient time was 4.1±0.05 SD days (range 0.7 – 22.8 days).

Table 2. Sites of foreign bodies at presentation to hospital.

Type of a foreign body	Site of a foreign body at presentation				Total (%)
	Stomach	Small intestine	Colon	Rectum	
Coins	8(57.1)	3(21.4)	2(14.3)	1(7.1)	14(42.4)
Nails	2(33.3)	2(33.3)	2(33.3)	0(0.0)	6(18.2)
Screws	2(50.0)	2(50.0)	0(0.0)	0(0.0)	4(12.1)
Pins	2(66.7)	0(0.0)	1(33.3)	0(0.0)	3(9.1)
Metal bars	2(100.0)	0(0.0)	0(0.0)	0(0.0)	2(6.1)
Others	2(50.0)	1(25.0)	1(25.0)	0(0.0)	4(12.1)
Total	**18(54.5)**	**8(24.2)**	**6(18.2)**	**1(3.0)**	**33(100.0)**

Fisher`s exact test, Value 25.139, P= 0.829

Table 3. Age and sex distribution according to transient time of foreign bodies

Transient time of foreign bodies (Days)	Age (Years)			Total (%)	Sex		Total (%)
	1-3(%)	>3-5(%)	>5-10(%)		Males (%)	Females (%)	
≤1	2(33.3)	3(50.0)	1(16.7)	6(18.2)	6(100.0)	0(0.0)	6(18.2)
>1-3	1(6.7)	10(66.7)	4(26.7)	15(45.4)	7(46.7)	8(53.3)	15(45.4)
>3-7	3(33.3)	5(55.6)	1(11.1)	9(27.3)	8(88.9)	1(11.1)	9(27.3)
>7	1(33.3)	1(33.3)	1(33.3)	3(9.1)	3(100.0)	0(0.0)	3(9.1)
Total	7(21.2)	19(57.6)	7(21.2)	33(100.0)	24(72.7)	9(27.3)	33(100.0)

Fisher`s exact test 5.212, P=0.64 for the age
Fisher`s exact test 8.043, P =0.02 for sex

There was a slight more delay (>3 days) in the passage of coins (50.0%, 7/14) than that for other objects, Table 4 . All children were managed conservatively with a close watchful waiting at their homes and no complications (like rectal bleeding, bowel perforation or intestinal

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obstruction) occurred to any child. But three children who had foreign bodies for more than 7 days were given laxatives to speed expel.

Table 4. Foreign bodies' distribution according to transient time

Type of foreign bodies	Transient time of foreign bodies (Days)				Total (%)
	≤1 (%)	>1-3 (%)	>3-7 (%)	>7(%)	
coins	3(21.4)	4(28.6)	5(35.7)	2(14.3)	14(42.4)
Nails	2(33.3)	2(33.3)	2(33.3)	0(0.0)	6(18.2)
Screws	0(0.0)	4(100.0)	0(0.0)	0(0.0)	4(12.1)
Pins	0(0.0)	2(66.7)	0(0.0)	1(33.3)	3(9.1)
Metal bars	0(0.0)	2(100.0)	0(0.0)	0(0.0)	2(6.1)
Others	1(0.0)	1(100.0)	2(0.0)	0(0.0)	4(12.1)
Total	6(18.2)	15(45.4)	9(27.3)	3(9.1)	33(100.0)

Fisher`s exact test 24.36, P =0.39

Discussion

Foreign body ingestion in children is common and in the majority of cases watchful waiting for the passage is sufficient. This survey revealed the preponderance of ingestion of foreign bodies in boys as similarly found in other studies [11-14]. This males` dominance may be due to their more activeness in curiosity or their less carefulness personality. The finding of under fives being the majority in this study corresponded to reports of other authors [11-14].This is probably due to children in this age group are more unaware of the hazardous behaviours or risky objects and so they require much close parental/guardian care and less exposure to small ingestible objects. In this study coins was the most frequent swallowed object likewise in other studies done by Panieri *et al* [11], Kaewwichian *et al* [12], and Melek *et al* [14]. However, Amin-Ranjbar [9] and Branavan *et al* [13] reported Button batteries from toys to be commonly ingested. This depicts the disparity in exposure to kinds of objects in children among different societies and cultures. There was a slight prolonged time between ingestion of a foreign body and presentation to hospital in the other survey done in Thailand [12] unlike in this study. This variation may be due to prolonged referral system in the other study setting. However, similar duration of 6 hours from ingestion to presentation in the majority of participants was reported by another author [15], probably reflecting the resemblance in the functioning of the health care referral systems in these areas.

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In this survey stomach was the most common site of the foreign body at admission as equally reported by others [11, 12] whereby coins formed the majority of swallowed objects. Unlike in other studies [9, 11] where small intestine was the commonest site and disc batteries being the most frequent ingested foreign body. This reflects the fact that small/short objects are likely to pass easier and fast through the gastric-intestinal tract than the large/long ones as it has also been revealed in this survey. The transient time of less than one week in the majority of cases in this study was the same as it was found in the study done by Melek *et al* [14] and the related mean transient time was observed in other studies [12,15]. One probable reason for this likeness and needs more research could be due to similarity in bowels objects propulsion ability among children of different societies or general similarity in the size of ingested objects.

In this analysis most of females had shorter transient time (<3 days) than males and this observation was statistically significant. However, this also requires a large detailed survey.. All cases were managed conservatively with watchful waiting for the exit of the object without complications. Except for three cases that did not pass a foreign body after one week received laxatives to hasten the excretion. Same treatment and outcome was reported in one previous study [11].

In contrast to other studies [12-14] flexible endoscopic intervention occurred due to the nature of the ingested objects being longer than 5centimeters and sharp and so difficult to negotiate through the curves of the duodenum and ileocaecal valve and high risk of bowel perforation . Also high risk of rupture or attraction to each other and cause bowel perforation as for the ingested disc batteries and magnets respectively and their prolonged stay in the stomach for more than 48 hours were the indications for flexible endoscopic removal. Surgical intervention was applied in cases ended up with bowel perforation, obstruction, prolonged stay of disc batteries in small bowels for more than 5 days or features of rupture and rupture(on x-ray) of narcotic capsules of illegal drugs. No child underwent endoscopic removal of a foreign body in this study on the other side due to lack of paediatric flexible endoscopes and their accessories in our setting.

Conclusion

Children under five years are at higher risk of ingesting foreign bodies. Coins were the commonest ingested foreign body. Stomach was the commonest location of objects at presentation. Most of children passed their foreign bodies within 3 days of swallowing. And all cases received conservative treatment with close follow up at home successfully. Therefore it is important for parents /guardians to take extra care for the under fives to ensure less exposure to ingestible objects. Watchful waiting management is useful; however, ensuring the availability of paediatric flexible endoscopic services is vital for cases that might require such intervention in future.

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