

Five years' experience with pyloric stenosis in Misan

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Abstract

Infantile hypertrophic pyloric stenosis is the commonest cause of gastric outlet obstruction and vomiting in infancy resulting from gradual hypertrophy of the smooth muscle of the pylorus. Reports have suggested that the incidence of pyloric stenosis is increasing. This is a prospective study aimed to defining the various aspects of IHPS cases.

A total no. of 39 patients presented to Alsader general teaching hospital during the period from January 2014 to the end of December 2018. The diagnosis was based on history, clinical examination with U/S study and we rarely need barium meal for the diagnosis. Results revealed that the male: female ratio was 12 to 1) male formed 92.3% while female is 7.6% of cases. The disease is more frequently in the first baby of the family (28 patients: 71.7%). Family history was positive in two cases (5.1%), associated anomalies are found in 2 cases which is about 5.1%. The mortality rate (0 %). In conclusion: The management start with the correction of the general state of patients then followed by operation (Ramstedts pyloromyotomy). Correction of fluid and electrolytes status of the patients preoperatively is very important to prevent operative and postoperative complications. Early feeding results in the retain of symptoms of vomiting so delay in the postoperative feeding up to the next postoperative day decrease the incidence of vomiting and risk of suffocation with overall reduction in the incidence of morbidity and mortality.

Keywords: Pyloric stenosis; Gastric outlet; Clinical examination; Incidence of morbidity ; Mortality

1. Introduction

Hypertrophic pyloric stenosis (HPS) causes a functional gastric outlet obstruction as a result of hypertrophy and hyperplasia of the muscular layers of the pylorus. In infants, hypertrophic pyloric stenosis is the most common cause of gastric outlet obstruction and the most common surgical cause of vomiting.

Typical presentation is onset of initially nonbloody, usually nonbilious vomiting at 4-8 weeks of age [1].

Although vomiting may initially be infrequent, over several days it becomes more predictable, occurring at nearly every feeding.

Vomiting intensity also increases until pathognomonic projectile vomiting ensues.

Careful physical examination provides a definitive diagnosis for most infants with hypertrophic pyloric stenosis. The diagnosis is easily made if the presenting clinical features are typical, with projectile vomiting, visible peristalsis, and a palpable pyloric tumor. Early in the course of the disease, however, some of the classic signs may be absent.

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2. Material and methods

2.1. Materials

A prospective study of 39 patients with infantile hypertrophic pyloric stenosis that were admitted and managed in to Alsader Teaching General Hospital during a period from January 2014 to the end of December 2018.

2.2. Methods

Data collected from those patients focused on age, sex, birth weight, body weight, onset of symptoms, duration of symptoms, family history, feeding history, sequence of the baby in the family and other aspects.

2.3. Statistical analysis

Data were subjected to analysis using SAS program. The chi-square test was used to assess the significant differences among percentages. $P < 0.05$ is considered as a significant difference.

3. Results

3.1. Age at time of presentation

The age of our patients at time of presentation ranged from 12 days to 3 months.

3.2. Onset of the symptoms

The onset of the symptoms of our patients at the time of presentation ranged from the first week of life up to the sixth week, but most of our patients' symptoms had started during the third week of life (Table 1).

Table 1 The onset of the symptoms of patients

age in weeks	Number of patients	Percentage	P-value
First week	1	2.5	<0.0001
Second week	2	5	
Third week	25	64	
Forth week	7	17.9	
Fifth week	3	7.7	
Sixth week	1	2.5	

3.3. Sex distribution

Most of our patients were male 36(92.3%) while female patients were 3 (7.7%).

3.4. Family history

It was positive in only two cases (5%)

One female with her sister

One male with his father

3.5. Body weight

It is either the same as birth weight shown in 28 patients, or below birth weight in patients in 4 patients or do not know birth weight in 7 patients.

3.6. The sequence of the patients in their family

Table 2 illustrated the sequence of patients

Table 2 The sequence of the patients in their family

Sequence	number	percentage	P-value
1st	28	71.7	<0.0001
2nd	7	17.9	
3rd	2	5.1	
4th	1	2.5	
5th	1	2.5	

3.7. Type of vomiting

The type of vomiting is shown in table 3

Table 3 Type of vomiting

Type	No	Percentage	P-value
projectile	37	94.8	<0.0001
Bloody	2	5.1	

3.8. Jaundice

Two patients were jaundiced at time of presentation, of indirect hyperbilirubinemia, it was of moderate severity (less than 10 mg/dl). Jaundice did not interfere with operation for our patients.

3.9. Dehydration

Was seen only in 13 patients 33% and most of them have mild dehydration.

3.10. Constipation

It was significant finding and found in 37 case.

3.11. Feeding history

The feeding history is shown in table 5.

Table 5 Type of feeding

Feeding history	No.	Percentage	P-value
Bottle	30	77	<0.0001
Mixed	6	15.3	
Breast	3	7.7	

3.12. Associated anomalies

Table 6 Associated anomalies

Anomalies	Number
Cerebellar agenesis, cleft lip, cleft palate and pulmonary stenosis	1
Corpus callosum agenesis	1

3.13. Abdominal examination: 2 important signs

Olive mass: was Palpable in 25 cases (64.1%) and Not palpable in 14 cases (35.9%)

Peristaltic movements were visible in 37cases (94.8%) and Not visible 2 cases (5.1%)

3.14. Ultrasonic finding

It was diagnostic in all our cases (100%), the reading of U/S includes both the length of pyloric canal (Table 7) and width of the thickness of pyloric muscle (Table 8).

Table 7 Length of pyloric canal

Length/mm	No	P-value
17	12	<0.0001
18	21	
19	2	
20	2	
21	1	
22	1	

Table 8 Thickness of pylorus

Thickness/mm.	Number	P-value
5	20	<0.001
5.5	10	
6	7	
6.5	2	

3.15. Roentgenographic study

We need contrast study for the diagnosis of pyloric stenosis in only 2 cases (5.1%) which were suspicious by U/S examination, and the results of contrast were comparable with that of U/S.

3.16. Onset of postoperative oral feeding

In most of our cases 34 cases (87%) we started oral feeding after the removal of N/G tube with in 12-24 hours.

3.17. Complications

3.17.1. Operative complications

37 cases of our patients had no complications during the operation, 2 cases complicated during the operation as mentioned in the following table.

Table 9 Operative complications

Complication	no.	Percentage
Perforation of duodenal mucosa	1	2.5
Delay recovery from anesthesia	1	2.5

3.17.2. Postoperative complications

27 cases of our patients had no postoperative complications, 12 patients had the following complications.

Table 10 The postoperative complication of patients

Postoperative complication	Number	P-value
Vomiting	11	<0.01
Wound infection	1	

3.18. Mortality

The mortality was (0%)

3.19. Hospital stay

The average hospital stay of most of our patients (37) after operation was two days (94.8%), and (2) patients (5.1%) was delayed to the 4th postoperative day .

4. Discussion

Pyloric stenosis is the most common surgical cause of vomiting in infancy, in all studies dealing with IHPS there is a male predominance. In our study male to female ratio was (12 :1) which is higher than others Bissonnette¹ study male to female ratio (5.7:1), Carter 5:1 [2] and 3:1 Walpole [3].

The first born baby is still the most commonly affected than others, in our study , the first born baby affected by (71%) and this differ 43% were firstborn by Taylor et al., [4] and 44% by Mark study [5] .

Regarding family history, in our study it was positive in only one case (5.1%) ,familial heritability also mentioned by others like Krogh et al., [6] and there was a documented positive family history in 17% Taylor et al., [4].

In our study, the patients' age at time of presentation ranged from the 1st to the 6th weeks of age, but the peak incidence was during the 2nd to the 3rd week (69%), in comparison to other studies; Mean age (weeks) at presentation was 5.4 ± 3.0 [7] and other report Between weeks 3–12 after birth [8].

Regarding nonbilious projectile vomiting, it was the main presenting symptom in our study (94.8%) which is comparable to 99.7% by Taylor et al [4] and 16 % hematemesis in comparison to 5% in our study, and the classical vomiting was absent in 1/3 of patients of Shaoul et al., [9].

7% of children with IHPS had a major malformation compared with 3.7% of the general population [10]. In our study 2 patients have malformations (5.1%).

In our study, the constipation was common symptom presented in (94.8%) which is also mentioned study done by Mark, [5], and mentioned as one of cardinal features in a study done by Tisdall et al., [11].

Regarding the type of feeding, in our study, breast feeding in (7.7%), mixed feeding in (15.3%) and bottle feeding in (77%), Bottle-fed infants experienced a 4.6-fold higher risk of Pyloric Stenosis compared with infants who were not bottle-fed [12], bottle feeding history seen in 60% of study done by Mark [5].

Dehydration reported by Taylor [4] mostly mild to moderate and rarely severe in 32% close to our study 33%, other reported 24% [5].

In our study, we found the palpable abdominal mass in (64.1%) compared and peristalsis movement was present in (94.8%) of cases and this is nearly different to the studies done An 'olive' was palpated on examination in 48%, visible peristalsis seen in 25% [4], half of patients have palpable mass by Shaoul et al., [9].

Jaundice occurred in 1-8% by Dodge¹³ and this is comparable to our study 5% other study showed 4%, Mark [5].

In our study, U/S examination was the golden technique for the diagnosis, the accuracy rate was 100% and this is completely similar to a study done by Stunden et al., [14] in which was also 100% and close to other that revealed a sensitivity of 97% and specificity of 99% By Neilson et al., [15].

Overall complication seen only in 2 patients (5.1%) comparable to 4% by [16] and higher than occurred in 2.71% [17]

Regarding the operative perforation of the duodenal mucosa occurred in only (2.5%) differ from 3.3% by Taylor⁴ and other studies like (8%) by Zeidan et al., [18].

In our study we started oral feeding in the next 12-24 hrs to minimize postoperative vomiting, this also mentioned by Turnock et al., [19]

Regarding postoperative vomiting, in our study it occurred in (11) cases (28.2%) and that was less than (36%) infants experienced by Spitz et al., [20] but all of them managed conservatively with slowly retain of the oral intake. Postoperative vomiting occurred only in 3% of Hulka study [16].

In our study, wound infection occurred in one patient (2.5%) which is close to 2.3% reported by Safford et al., [17] and higher than 1% [16].

The mean post-operative stay was 2.4 days by [4] compared to 2 days in our study.

Regarding the mortality rate, in our study it was (0%) and this is the lowest among Hulka study that showed (0.1%) [16] other report 0.62% Benson et al., [21].

5. Conclusion

High male: female ratio is reported in our study
Constipation is common presenting symptom.

- In our study, non-bilious projectile vomiting is the commonest type of presentation and should be taken with a high index of suspicion in every infant.
- Pyloric stenosis is more common in male and specially the first born baby.
- Ramstedt's operation remain the most rewarding operation in pediatric surgery.
- U/S is diagnostic in 100% of our patients, so U/S is a reliable diagnostic tool if it is used in an experienced hand.
- Mortality was 0% due to good preoperative preparations.

Recommendations

- Pyloric stenosis is considered as a semi emergency rather than an emergency condition.
- Correction of fluid and electrolytes status of the patients preoperatively is very important to prevent operative and postoperative complications.
- Early feeding results in the retain of symptoms of vomiting so delay in the postoperative feeding up to the next postoperative day decrease the incidence of vomiting and risk of suffocation with overall reduction in the incidence of morbidity and mortality.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declared no conflict of interest.

Statement of informed consent

Adequate and appropriate information about research and researchers were provided.

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