Pattern of gastroesophageal reflux in children

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ABSTRACT

Objective: Gatroesophageal reflux disease is a common health problem in children worldwide. There are no published data on this disease in children from Saudi Arabia. The objective of this study is, therefore, to report on the pattern of gastroesophageal reflux disease in Saudi children.

Methods: Retrospective review of all children referred to the Pediatric Gastroenterology Division at King Khaled University Hospital in Riyadh.

Results: The diagnosis was confirmed in 85 children, all but 2 were Saudi nationals, and the male to female ratio was 1.6. The median age of onset of symptoms was 10 months, whereas the median age at referral was 20 months. The pattern of clinical presentation indicates that vomiting is the most common presentation occurring in 82% of the children, followed by respiratory disease in 38%. An underlying condition was found in 41% of the children, (35/85) the most common of which was neurological impairment. Peptic esophagitis was present in 51.5% of the children who underwent endoscopy. The median duration of follow up was 6 months. Good response to medical therapy was documented in 72% of normal children and 27% of those with underlying disease. All of the 23 children who had fundoplication in our institution had one or more of the underlying disorders.

Conclusions: Gastroesophageal reflux disease is a common problem in Saudi children. The overall pattern in this report is similar to descriptions in the literature. Prospective multicenter studies are needed to confirm this pattern and to provide more focused descriptions of other aspects of the disease.

Keywords: Gastroesophageal reflux, clinical presentation, esophagitis, medical therapy, fundoplication, children.

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Gastroesophageal reflux in children is a normal phenomenon. It occurs in the majority of healthy children and presents as a simple regurgitation. These physiologic reflux episodes must be differentiated from pathologic reflux disease (GERD). The difference between the two is a matter of quantity and severity. Physiologic reflux causes mild regurgitation and occasional vomiting, but does not affect growth or cause respiratory symptoms, nor does it cause esophageal injury. The pattern of GERD is well described in the literature based on data collected from many parts of the world.[1-3] However, to our knowledge, published data from Saudi Arabia is scarce. In a survey of pediatric gastroenterologic disorders from a single hospital and subsequent review, it was noticed that GERD is not uncommon and the need for further study was identified.[4,5] The objective of this report is to describe the pattern of GERD in Saudi children attending King Khalid University Hospital (KKUH) in Riyadh, hoping that this information will produce baseline data and stimulate further research to improve the care of children affected by this disease.

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Methods. The patients in this study include all the children from 0-12 years referred to the Pediatric Gastroenterology Division, Department of Pediatrics, College of Medicine, KKUH in Riyadh. They were referred either from the general pediatric sorting clinics, the inpatient wards, or other subspecialty clinics. A retrospective review of the medical records was performed and only patients with confirmed diagnosis of GERD were included in the analysis. The diagnosis was considered confirmed when the 24-hour intraesophageal pH study was unequivocally abnormal, or when esophagitis was clearly present on endoscopy. The presence of reflux on barium studies was considered significant if confirmed by another investigation such as scintigraphy or ultrasonography. The latter has been recently reported to be a useful noninvasive method of sufficient accuracy in the diagnosis of GERD.[6] Similarly, the presence of reflux on the latter two studies is considered significant only when supported by another study. The children were investigated and managed in a way similar to the recommendations of the European Society for Pediatric Gastroenterology and Nutrition.[7] Initial management included thickening of feeds, positioning 30 degrees caudal inclination in the prone position, and cisapride. H-2 antagonists (most commonly ranitidine) are added only if there is evidence of esophagitis and proton pump inhibitors (omeprazole, pantoprazole) are used only in cases resistant to the former medication. The data extracted from the charts included the name, medical record number, nationality, gender, date of birth, age at onset of symptoms, age at referral, and the nature of the presenting symptoms. The presence of FTT, any underlying condition, or esophagitis was noted. Finally, the response to medical therapy, and the length of follow up were recorded for each patient. The data was analyzed using simple descriptive statistics.

Results. Between 1994-1999, 144 children were referred for suspected GERD. The diagnosis was confirmed in 85 children who are the subjects of the study. All the children but 2 were Saudi nationals, and the male to female ratio was 1:6. The median age of onset of symptoms was 10 months, whereas the median age at referral was 20 months. The pattern of clinical presentation is shown in Table 1 indicating that vomiting is the most common presentation in 82% of the children, followed by respiratory disease in 38%. Table 2 indicates that an underlying condition was found in 41% of the children (35/85) the most common of which was neurological impairment. Peptic esophagitis was diagnosed in 34 of the 66 children (51.5%) who underwent endoscopy at the time of presentation. The median duration of follow up was 6 months (Range 6 weeks to 5 years). Good response to medical therapy was documented in 72% of normal children (26 out of the 36 normal children in whom follow ups were recorded). In patients with an underlying disorder, however, the overall response to medical therapy was good in only 27% (7 of the 26 patients with documented follow up). The breakdown of this group indicates a good response in 33% of the children with hiatus hernia (3/9), and in 36% of those with neurologic disorder (4/11).

Table 1 - Clinical presentation of GERD in 85 children.

Clinical features	Number (%)
Gastrointestinal	
Vomiting	70 (82)
Hematemesis	12 (14)
Dysphagia	7 (8)
Respiratory	
Recurrent pneumonia	14 (44)
Asthma	12 (38)
Stridor	4 (12)
Apnea	2 (6)
Failure to thrive	16 (19)

Table 2 - Underlying disorders in 35 children with GERD.

Underlying condition	Number (%)
Hiatus hernia	12 (34)
Neurologic disorders	16 (46)
Cerebral palsy	7
Degenerative brain disease	2
Infantile spasm	2
Central hypotonia	2
Down syndrome	2
Unspecified type	1
Tracheoesophageal fistula	5 (14)
Others (1 cyclic vomiting 1SMA*)	2 (6)

*Superior Mesentery Artery syndrome

However, none of the children with tracheoesophageal fistula and cyclic vomiting who also had hiatus hernia or superior mesenteric artery syndrome responded to medical therapy. All of the 23 children who had fundoplication in our institution had one or more of the above-mentioned underlying disorders or high-grade esophagitis or both.

Discussion. Despite the availability of resources and manpower in major hospitals in the Kingdom, we are not aware of any published data on GERD in children. Although we have been managing children with this condition for a long time, it was decided to analyze the data starting from 1994 which corresponds to the time 24-hour esophageal pH studies became available in our institution. The retrospective nature and the referral bias are well-recognized limitations of this report. However, such a study does give general information on the pattern of this disorder in children living in this part of the world. The diagnosis of about 14 new patients per year in one single general hospital (KKUH) indicates that GERD is an important health problem similar to the situation in other countries.[1-3] The male predominance in our population is consistent with virtually all reports. The median age of onset of symptoms of 6 months is much later than the usual age at presentation of about 2 months.[1,2] Furthermore, the late referral of our patient at a median age of 20 months contrasts with the 16 months reported in other studies.[8] The clinical presentation of GERD in this study includes all features described in other reports with few differences. The predominance of vomiting in 82% of our patients is slightly lower than the generally quoted figure of 90%, but higher than the 72% figure reported from London.[8] There are two interesting remarks about vomiting in GERD. The first is that 18% of our children with GERD did not present with vomiting making the diagnosis perhaps more difficult and contributing to delayed referral and management. The second remark is that vomiting was projectile in 3 of our patients, a finding similar to other studies.[1,2] The pattern of pulmonary presentation in our patients is similar to that in other reports. Recurrent aspiration pneumonia, asthma-like symptoms, stridor, and apneic episodes have all been reported by different authors with varying incidence.[9-12] Failure to thrive (FTT), another feature of GERD, is most often caused by caloric deficiency as a result of vomiting. Accordingly, children with GERD may thrive normally if vomiting is mild or absent. Thus, normal weight gain does not rule out significant GERD. This is illustrated by the fact that the majority of the children do not have FTT at the time of presentation. In our study, only 19% had FTT, a finding that compares with 28% in other reports. The high-risk conditions identified in this study are similar to those in other publications. Neurologic impairment, corrected tracheoesophageal fistula, and hiatus hernia have been reported risk factors.[13-15] However, two rare conditions causing secondary reflux were identified. These include one case of cyclic vomiting in a 6 year-old boy, and another case of superior mesenteric artery syndrome in an 11-year old girl who presented with chronic, bile-stained vomiting. The high incidence of endoscopic esophagitis in this study (51.5%) is not much different from the figure of 62% in one report,[8] but contrasts with the lower incidence of 18% in another study.[16] This variation in the incidence of esophagitis depends on the age at presentation, the type of presentation, and the indication for endoscopy. The pattern of response to medical therapy in our patients without underlying disease (72%) is similar to that reported by others. In a study of 69 children from London, Lee et al reported that 66% of the children were able to discontinue medication within 12 months and remained well.[8] In another report from the USA by Tolaymat and Chapman dealing with GERD in older children who were normal (age range 3-19 years), the response to an initial course of medical therapy was 62%.[17]

In conclusion, this report, despite its drawbacks, demonstrates that GERD is an important health problem in Saudi children. Its pattern in this group of children is similar to that reported from other countries. Prospective multicenter studies are needed to confirm this trend and define the characteristics of this disease more precisely.

References

1. Carre IJ. The natural history of the partial thoracic stomach (hiatal hernia). Arch Dis Child 1959; 35: 344-353.
2. Herbst JJ, Meyers WF. Gastroesophageal reflux in children. Adv Pediatr 1981; 28: 159-186.
3. Orenstein SR. Gastroesophageal reflux. Pediatr In Rev 1999; 20: 24-28.
4. El Mouzan MI, Khwaja S, Abomelha A, Magbool G. The pattern of pediatric gastrointestinal disorders in the Eastern Province J Trop Pediatr 1989; 35: 264-265.
5. El Mouzan MI. Gastroesophageal reflux in infants and children. Ann Saudi Med 1991; 11: 152-157.
6. Ricabona M, Maurer U, Lackner H, Uray E, Ring E. The role of sonography in the evaluation of gastro-oesophgeal reflux – correlation to pH. Metry Eur J Pediatr 1992; 151: 655-657.
7. Vandenplas Y, Ashkenazi A, Belli D, Boige N, Bouquet J, Cadranel S et al. A proposition for the diagnosis and treatment of gastro-oesophageal reflux disease in children: A report from a working group on gastro-oesophageal reflux disease. Eur J Pediatr 1993; 152: 704-711.
8. Lee WS, Beatie RM, Meadows N, Walker-Smith J. Gastro-oesophageal reflux: Clinical profile and outcome. J Paediatr Child Health 1999; 35: 568-571.
9. Orenstein SR, Orenstein DM. Gastroesophageal reflux and respiratory disease in children. J Pediatr 1988; 112: 847-858.
10. Berquist WE, Rachelefsky GS, Kadden M, Siegel SC, Katz RM, Fonkalsrud EW et al. Gastroesophageal reflex-associated recurrent pneumonia and chronic asthma in children. Pediatrics 1981; 68: 29-35.

11. Orenstein SR, Orenstein DM, Whitington PF. Gastroesophageal reflux causing stridor. Chest 1983; 84: 301-302.
12. Spitzer AR, Boyle JT, Tuchman DN, Fox WW. Awake apnea associated with gastroesophageal reflux: A specific clinical syndrome. J Pediatr 1984; 104: 200-204.
13. Sondheimer JM, Morris BA. Gastroesophageal reflux among severly retarded children. J Pediatr 1979; 94: 710-714.
14. Curci MR, Dibbins AW. Problems associated with Nissen fundoplication following tracheoesophageal fistula and esophageal atresia repair. Arch Surg 1988; 123: 618-620.
15. Darling DB, Fisher JH, Gellis SS. Hiatal hernia and gastroesophageal reflux in infants and children: Analysis of the incidence in North American children. Pediatrics 1974; 54: 450-455.
16. Shub MD, Ulshen MH, Hargrove CB, Siegal GP, Groben PA, Askin FB. Esophagitis: A frequent consequence of gastroesophageal reflux in infancy. J Pediatr 1985; 107: 881-884.
17. Tolaymat N, Chapman DM. Gastroesophageal reflux disease in children older than two years of age. W V Med J 1998; 94: 22-25.