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Original Article

Clinical Presentation of Gastroesophageal Reflux Among Children With Chronic Constipation

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ABSTRACT

The gastro-esophageal reflux disease is the type of gastrointestinal disorder which is very common in children. To evaluate the overlap and correlation between different gastrointestinal track disorders different epidemiological studies are conducted. The chronic constipation and gastroesophageal reflux are the functional disorder of gastrointestinal (GI) track with the significant correlation. **Objective:** The purpose of the study was to elaborate the relationship between the very common and functional disorders of the gastrointestinal (GI) track; the gastroesophageal reflux and the functional constipation. The percentage frequency of gastroesophageal reflux in the children was calculated. **Methods:** This was a cross-sectional study with statistical approach, conducted in Pakistan Institute of Medical Sciences, Islamabad and Abbasi Shaheed Hospital, Karachi for the duration of six months from December 2020 to May 2021. Those patients who referred to pediatric gastroenterology department of hospital were included in the study. The children were diagnosed with functional constipation. For the diagnosis of FC the Rome III criteria was applied. Two groups were established. There were 34 number of patients diagnosed with FC in the experimental group, while 36 children suspicion of GERD disease were placed in control group. **Results:** The mean age of the children referred to the pediatric gastroenterology lab was observed to be 8 years. Out of 34 patients included in the experimental group the 15 were male and other 29 were female. Similarly out of the 36 patients included in the control group the 16 were males and other 16 were females. The 24 months was observed as the mean duration of functional constipation. The 50% were experiencing hiccups in the experimental group, while 22% in the control group. The 75% patients in the control group suffering from chronic cough, while regurgitation were reported in other 72%**.** The 50% in the experimental group experienced belching. Coughing and regurgitation were seen in about 47% patients. **Conclusion:** The one of the most considered factors in treatment and monitoring of chronic constipation is functional gastrointestinal disorder. The symptoms of gastroesophageal reflux can be improved by treating chronic constipation.

INTRODUCTION

The functional gastrointestinal disorder (FGID) developed as a results of ENS adaptive responses to the physiological triggers. The gastroesophageal reflux disease is most common type of FGID in the children. The scientist are willing to uncover the factors involve in pathogenesis of gastroesophageal reflux disease and functional constipation1. At the instant general hypothesis is that different psychogenic and hormonal elements are involved in causing these FGID diseases. The gastric content flows back to the esophagus. The complications caused by this retrograded flow are defined as gastroesophageal reflux diseases (GERD). It is the one of the most prevalent complication of childhood. The delay in gastric emptying is a major risk factor associated with the disease. The other risk factors are nutritional habits of the childhood. The gastrointestinal motility of gastric content is highly

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affected by functional constipation2-3. During functional constipation the transit time of colon lengthen that ultimately leads to temporary increased in intra-abdominal pressure. Due to changing living conditions, the functional constipation is observed in majority of children. The reported percentage of functional constipation is 8.3%. The functional constipation can lead to colon distention. The gastric waves are impaired by rectal distention. The most commonly observed symptoms in GRED patients are temporary heartburn4-5. The irregular vomiting followed by early satiety are also observed in children suffering from FC. The motility and microcirculation of the gut is normally controls by enteric nervous system(ENS)6. The continuous maintenance therapy is required for the treatment of GRED. The commonly used first-line diagnosis and treatment therapy for gastroesophageal reflux disease is proton pump inhibitor7-8. The purpose of the study was to elaborate the interrelationship exist between constipation and reflux. The chronic upper intestinal infections occur in correlation with functional constipation. The overlaps between the different gastric functional disorders need to evaluate for controlling the percentage of FGID patients in pediatric gastroenterology clinics9-10.

METHODS

This was a cross-sectional study with statistical approach, conducted in Pakistan Institute of Medical Sciences, Islamabad and Abbasi Shaheed Hospital, Karachi for the duration of six months from December 2020 to May 2021. The children referred to pediatric gastroenterology department of our hospital were included in the study. The children had the complaint of functional constipation. The mean age of the children included in the study was between 4-16 years. The Rome III criteria were applied for the FC diagnosis. The children suffering from mental retardation were excluded from the study. Those who were allergen to foods and showed abnormal thyroid functions were excluded. The ethical committee of the hospital approved the present study. But it didn't approve the group of healthy children to be included in the control group. Therefore the patient suspicions of having GERD disease were included in the control group. The Rome III was also applied on this group. Basically in the present study two groups was established. One is experimental with 34 numbers of patients which are diagnosed with FC, while the other is control group with 36 children suspicion of GERD disease. The results were recorded. After the recording of clinical findings, a questionnaire about reflux related symptoms were given to every patient for further evaluation of the findings. The Antimony dual canal probe was used to monitor esophagus pH of every patient. The 10cm signal meter probe were used for monitoring pH of the patient having age above 5 years, while 5cm signal meter probe was used for the patients having age below 5 years. The electrodes of the pH meter were placed in-accordance with esophageal X-ray graphics. The pH meter probe distal end was inserted nasopharyngeal to the esophagus, while proximal end was inserted to the upper sphincter of esophagus. After 24 hours of strict monitoring of pH, the children were allowed to go back home. The esophageal pH less than 4 were defined as acid reflux. The total episodes of this reflux were greater than 40. The lasting time for this reflux was 15 seconds. While the acid reflux having pH less than 4 with the lasting time of 5 mints were seen in 5 patients. These were calculated with the help of distal probe. The reflux index calculated by using proximal probe of pH meter was 1% while using distal probe of the pH meter was 5%. The t-test and chi-square test was used for the statistical analysis of the data. A comparison between the findings of control and experimental groups was made. The results were reported.

RESULTS

The mean age of the patient attended the pediatric gastroenterology lab was calculated. It was observed to be 8 years. The 24 months was observed as the mean duration of functional constipation. In about 50% patients included in experimental group had the complaint of hiccup and belching. Coughing and regurgitation were observed in about 47% patients. While in the control group 75% patients had complaint of chronic cough, while regurgitation were reported in other 72% (showed in table 1). The more common symptoms in patient diagnosed with FC was hiccups and belching. While the chronic cough was more common in the patients with the reflux related symptoms. The distal channel acid reflux was observed in 26% patients of experimental group, while 35% had proximal channel acid reflux. The distal channel acid reflux was seen in 30% patients of control group while, other 33% had proximal channel acid reflux.

The observed symptoms	Experimental group (n=34)	Percentage	Control group (n=36)	Percentage	Calculated P-value
Hiccups	17	50%	8	22.2%	0.021
Regurgitation	16	47%	26	72.2%	0.071
Vomiting	6	17.6%	10	27.7%	0.456
Pyrosis	9	26.4%	15	41.6%	0.708
Bronchitis	8	23.5%	11	30.5%	0.708
Wheezing	9	26.4%	14	38.8%	0.297
Chronic cough	16	47%	27	75%	0.012
Belching	17	50%	6	16.6%	0.002
Hoarseness	11	32.3%	11	30%	0.924

Table 1: The percentage of reflux related symptoms observed in experimental and control group;

From pH monitoring the percentage of acid reflux episodes were calculated. It was observed that 38% of patients of

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experimental group and 41% patients of control group had the acid reflux(involving lower part of esophagus). The 26% patients of experimental group had distal channel acid reflux, while 35% had proximal channel acid reflux.

Esophageal pH monitoring parameters	Experimental group	Percentage	Control group	Percentage	P value
Proximal probe with reflux index greater than 5%	12	35.2%	12	33.3%	0.86
Distal probe with reflux index greater than 1%	9	26.4%	11	30%	0.95
Positivity of proximal and distal probe	13	38.2%	15	41%	0.75
Acid reflux episodes greater than fifty	3	8.8%	3	8.3%	0.67
Acid reflux lasts for more than 5 minutes	7	20.5%	13	36.1%	0.26
Mean of the distal reflux index	1.2	3.3%	1.3	3.53%	0.82
Mean of the proximal distal index	0.6	1.08%	0.3	0.8%	0.61

Table 2: The percentage of esophageal pH monitoring parameters in experimental and control group

The 30% patients of control group had distal channel acid reflux, while other 33% had proximal channel acid reflux. The results of group I and II were compared and findings were reported for further evaluation(showed in table 2).

DISCUSSION

The two most common disorder of gastrointestinal tract are GERD and FC. These occur simultaneously at the instant. The knowledge about their pathologies and overlap is still need to uncover. The children diagnosed with FC are more prone to symptoms like, GERD and abnormal acid flux. It was observed that about 60-65% of the children diagnosed with FC had the GERD symptoms while, other 50% had symptom of abnormal acid reflux. With the increase in defecation frequency has a strong impact on the abnormal acid reflux11. While in other the increase in defecation frequency don't have any effect, the abnormal acid reflux remain continue. The abnormal acid reflux can be reduced by treatment of constipation. It also reduce the symptoms of GERD. According to the data obtained from the questionnaire, it was observed that about 50% of the patients involved in present study had the history atopy of GERD. The one of the highly known risk factor of the GERD disease is positive family history of GERD12-13. The prevalence of atopic conditions in the patient diagnosed with FC is higher than the patient included in the control group. GERD is affected by many factors; it is known to be a multifactorial disease. The limited knowledge is present about this disease. The need of the hour is to uncover the pathophysiology of the disease. This will not only help to plan better treatment strategies but also give insights into the correlation and overlap between the FC and GERD14-15. The symptoms of upper gastrointestinal tract are observed in the patients with slow transit constipation. These includes vomiting, regurgitation and dyspepsia. The cologastric brake mechanism is used to explain the emptying of gastric16. Fecal stasis (rectum or anus) and delayed gastric emptying is observed in the patients suffering from constipation. The gastric emptying is highly controlled by the feces retention in the rectum. The only reasonable explanation at the moment for the continuous abnormal acid reflux instead of increasing frequency of defecation, is that the FC overlap with the GERD17. After the treatment of chronic constipation the reflux index of acid and its growling was significantly reduced. On the other hand the defection frequency increases always. The enteric system of young children response more frequently and strongly to the constipation treatment. Comparing this observation with the adolescent children, the response slow down18-19. Constipation among the children having age up to 12 years have no gender predominance. It was observed that there is no significant relationship between the bowel habits and constipations. The episodes of acid reflux and defecation frequency are negatively related with each other. The gastric motility increased by the decrease in intra-abdominal pressure. This ultimately leads to decrease in acid reflux episodes.20 The Borowitz et al. conducted the similar research and findings of the present study and his are highly comparable with each other. After the treatment of patient with chronic constipation the patient diagnosed with GERD don't complaint about the symptoms such as intermittent vomiting and heartburn, hence these also vanished with the FC treatment. The patient having complaint of chronic constipation, can also have GERD disease. For the in-depth exploitation of the correlation between the FC and GERD the further studies are required21. The pH meter impedance analysis must be carried out in the next studies. The symptoms of GERD varied, these variations are less common among the adults. For the clear diagnosis of non-acid reflux the esophageal pH monitoring don't correlate. Acid reflux is more commonly caused by delayed is gastric emptying. The emptying time of gastric was not determined in the present study. The pretreatment and post treatment data was compared and the constipation treatment efficacy in acid reflux was determined in the patients with Fc22.

CONCLUSION

The GERD and FC overlap in many cases, and this overlap has increased the risk of percentage mortality in the children. The post-treatment data of the patient suffering from FC and GERD, showed that the reflux symptoms reduced. Therefore for the treatment of the patient having complaint of FC, the GERD must be considered. It will help in better treatment and monitoring of functional

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constipation.

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