

## ENDOSCOPIC AND HISTOPATHOLOGIC CHANGES IN CHILDREN WITH CHRONIC DYSPEPSIA IN A RURAL MEDICAL COLLEGE HOSPITAL IN MELMARUVATHUR- TAMILNADU

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### ABSTRACT

#### INTRODUCTION

Chronic pain abdomen and dyspepsia is the most common presenting symptoms in the Paediatric Outpatient Department (OPD) after respiratory illnesses. It is increasing alarmingly both in the paediatric and adult population. We, therefore carried out a cross-sectional study among children with chronic dyspepsia aged between 5 to 15 years attending Paediatric OPD in a rural medical college hospital, Melmaruvathur, Tamilnadu, South India.

#### OBJECTIVE

To evaluate the gastroduodenal morbidity in children presenting to the paediatric department of a rural medical college hospital with chronic dyspeptic symptoms.

#### METHODS

Forty six children between the age group of 5 to 15 years with chronic dyspeptic symptoms of at least one month duration were evaluated for their symptom profile, epidemiological profile, nutritional status, endoscopic appearance and histopathological changes. Data analysis was done using SPSS version 18.

#### RESULTS

Of the 46 children studied, 43% were between the age group of 5-10 years and 70% were female children. Pain abdomen lasting for more than at least one month was the most common finding (93%) observed. Other common symptoms in the order of decreasing frequency were early satiety (87%), poor appetite (76%), nausea (57%) and not thriving (57%). History of loss of appetite was significantly associated with chronic dyspepsia with an odds ratio of 68.9394 and 95% confidence interval 26.62 to 178.54, p value of <0.0001. Most of the children belonged to lower income group predominantly of a rural background. 33 (72%) children had under nutrition as per IAP classification. 10 (30%) Grade I, 15 (45%) Grade II and eight (24%) had Grade III malnutrition.

26 children (57%) had abnormal endoscopic findings. Antral mucosal biopsy done showed chronic lymphocytic gastritis in 44 (96%) cases. 38 of these 44 (86%) were H. pylori positive. H. pylori positivity in chronic dyspepsia was highly statistically significant with a p value of 0.0001

#### CONCLUSION

The incidence of dyspepsia is common among children between the age group of 5-10 years with a female preponderance. The predominant symptom noted among these rural children are abdominal pain and loss of appetite. Multiple gastric erosions is the common finding observed endoscopically and H. pylori associated gastritis is the overwhelming finding in our children with chronic dyspepsia.

#### KEYWORDS

Endoscopy, Histopathology, Gastrointestinal Symptoms, H. Pylori, Malnutrition.

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**INTRODUCTION:** Chronic pain abdomen and dyspepsia is the commonest presenting symptom in the paediatric Outpatient Department (OPD) after respiratory illnesses and it is increasing alarmingly both in the paediatric and adult population. H. pylori is a ubiquitous infection of the stomach the world over.<sup>(1)</sup> Over 50% of the world's population is infected with this organism.<sup>(2)</sup> Though, the incidence is decreasing in developed countries, it is still very high in developing countries like India where infection rates are around 80% in adult population.<sup>(2,3)</sup> Most of them are

infected in childhood itself. There is a concern about carcinogenic effects of *H. pylori*, which has been classified as a group 1 carcinogen by WHO.<sup>(3)</sup> The early preneoplastic changes of gastric atrophy and intestinal metaplasia noted in many studies in the paediatric population itself is of concern as it may lead to gastric carcinoma in adults.<sup>(2,4,5)</sup> So, this study is aimed to assess the endoscopic and histopathological changes in dyspeptic children of this rural area of Melmaruvathur.

**MATERIAL AND METHODS:** Children between the age group of 5 to 15 years presenting to paediatric OPD of a rural tertiary care hospital, Melmaruvathur, with symptoms of chronic dyspepsia lasting at least for one month were included in the study. The Rome III Committee defined dyspepsia as "a symptom or set of symptoms that most physicians consider to originate from the gastroduodenal area." Dyspepsia is defined as a set of symptoms either related or unrelated to food ingestion localised on the upper half of the abdomen. They include: a) epigastric discomfort or pain, b) postprandial heaviness and c) early satiety. Associated complaints include: nausea, belching, bloating and epigastric burn (heartburn).<sup>(6)</sup> Detailed history of various symptoms pertaining to the upper gastrointestinal system was taken including pain upper abdomen, nausea, vomiting, poor appetite, retrosternal pain and not thriving. The demographic data collected included age, sex, socio-economic strata and rural/urban background. History of antibiotic or proton pump inhibitors intake over the past month was obtained. Children with history of antibiotic intake over last month and proton pump inhibitors over last 2 weeks were excluded from the study.

General physical examination included evaluation of the anthropometry and clinical evidence of anaemia. Per abdomen examination was done and presence of epigastric tenderness was recorded. Baseline investigations done included haemogram, urine analysis and ultrasound abdomen. Upper gastroduodenal endoscopy was done by a single physician and antral mucosal biopsy was sent for Histopathological Examination (HPE). Haematoxylin and eosin stain was done to assess histopathologic changes and the degree of inflammation in the antral mucosa. Giemsa staining was done to identify the presence of *H. pylori* and its density.

On HPE, the degree of chronic inflammation in the form of lymphocytic infiltration, degree of acute tissue injury in the form of neutrophilic infiltration and the presence and density of *H. pylori* infection was noted. Early preneoplastic changes such as gastric atrophy and intestinal metaplasia were also looked for. Statistical analysis was done using chi square by SPSS software.

**RESULTS:** Forty six children between 5 to 15 years were evaluated over a period of one year. The predominant age group affected were between 5-10 years (43%) and the average age was 10. Of these, 14 (30%) were male children and 32 (70%) were female children. Most belonged to lower income group of a rural background.

**Symptom Analysis:** Pain abdomen more than one month was the common symptom seen in 43 (93%) children and three cases had other dyspeptic symptoms such as poor appetite, early satiety, nausea and vomiting. Other major symptoms found were early satiety 40 (87%), poor appetite 35 (76%), nausea 27 (59%), failure to thrive 26 (57%), constipation 23 (50%), history of regurgitation of food in 22 (49%), retrosternal pain in 22 (49%), vomiting in 21 (46%) and sensation of abdominal bloating in 14 (30%). Twelve (26%) children had history of recurrent fever and 10 (22%) had history of recurrent diarrhoea and 25 (54%) had history of worms in stools.

History of loss of appetite was significantly associated with chronic dyspepsia with an odds ratio of 68.9394 and 95% confidence interval 26.62 to 178.54, p value of <0.0001. Only 13 (28%) children were normally nourished and remaining 33 (72%) were undernourished as per IAP classification. Among the undernourished, 10 (30%) were of Grade I, 15 (45%) of Grade II and 8 (25%) of Grade III malnutrition.

**Gross Endoscopic Findings:** Out of these 46 children, 26 children (57%) had abnormal endoscopic findings. Gastric erosions were seen in 21 (81%) children (Figure 3, 4), duodenal erosions were seen in 15 (58%) cases and duodenal ulcers were noted in 2 (8%) cases. Combined gastric and duodenal erosions were seen in 7 (27%) cases and one child had extensive erosions of oesophagus, stomach and duodenum. Nodular gastritis was observed in one case (4%) and oesophagitis in one case (4%). Three children (12%) showed incompetent Oesophagogastric Junction (OGJ) and hiatus hernia was noted in four (15%) cases (Table 1).

**Microscopic Findings:** Histopathologic Examination (HPE) of antral mucosal biopsy was done in 46 children. Of these, 44 (96%) had abnormality on HPE and *H. pylori* associated chronic lymphocytic gastritis was noted in 38 cases (83%). Six cases (14%) showed chronic lymphocytic gastritis without evidence of *H. pylori*. *H. pylori* infiltration was mild-to-moderate in 31 (82%) (Figure 5) and high in seven cases (18%). *H. pylori* positivity in chronic dyspepsia was highly statistically significant. Chi-square value = 168.941 with a p <0.0001.<sup>(1,2)</sup> Lymphocytic infiltration was mild-to-moderate in 28 (74%) and high in 10 cases (26%) (Figure 6). Neutrophilic infiltration was noted in four cases (10%), mild-to-moderate in three cases (8%) and high in one case (3%). In our series, no atrophy of mucosa was noted and intestinal metaplasia was noted in five cases (13%) (Table 2).

**DISCUSSION:** The incidence of dyspepsia among children is common nowadays. In our study, the predominant age group affected were between 5-10 years (43%) and female children (70%) were commonly affected. Symptoms of dyspepsia vary from pain abdomen, early satiety, poor appetite, nausea, vomiting, failure to thrive, gastrointestinal bleeding. In our study, pain abdomen was the most common finding in 43 (93%) children and other common symptoms

found were early satiety (87%), poor appetite (76%), nausea (57%) and failure to thrive (57%). This was supported by studies done by Abdel Razak, Ozbey et al, Oliveira et al who also observed pain abdomen as a common symptom in 67.5%, 57.4%, 34.6% cases, respectively.<sup>(2,7,8)</sup> Gastrointestinal bleeding was observed in studies by Oliveira et al (13.4%), Ozbey et al (11.9%), Motamed et al (9.8%), K Thakkar (5.8%) whereas we did not see any child with complaints of gastrointestinal bleed.<sup>(2,8,9,10)</sup> Under nutrition and growth retardation was observed in dyspeptic children by Ozbey et al (21.8%) and K Thakkar (2.4%).<sup>(8,10)</sup> In our series, we found history of not thriving in 26 (57%) cases and a very high incidence of under nutrition in 33/46 (72%) children as per IAP classification. Ujjal Poddar has reinforced endoscopy as the most preferred method for evaluating children with chronic dyspeptic symptoms.<sup>(1)</sup> K Thakkar has reported chronic pain abdomen as the most common indication for endoscopy and has reported 38% pickup rate of gastroduodenal pathology by histopathology in their series on endoscopy.<sup>(10)</sup> In our study, we had a very high

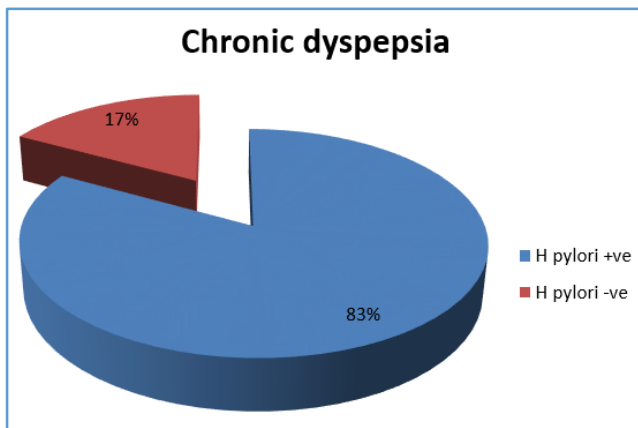
pickup rate of both macroscopic and microscopic findings. Abnormal macroscopic endoscopic findings was observed in 26 (57%) children when evaluated for chronic dyspepsia and an astounding 44 (96%) cases had abnormal HPE. The predominant endoscopic findings in our study was gastric erosions (62%) in varying degrees including only antral erosions (8%), erosions involving more than one part of gastric mucosa (73%) and pan gastritis involving the entire stomach (50%). This finding was supported by similar study done by Kumar et al who recorded 71% endoscopic antral gastritis and 85% histopathological antral gastritis.<sup>(11)</sup> In contrast to our findings, Deepak Bansal et al observed no macroscopic lesions in the gastroduodenal mucosa and noted 16% incidence of oesophagitis.<sup>(12)</sup> But, our study showed oesophagitis in one case (4%) only. Nodular gastritis, which has been reported to be typical of H. pylori gastritis<sup>(9)</sup> was observed in only one case (4%) in our study whereas Ozbey et al recorded antral nodularity in 54.5% cases.<sup>(8)</sup>

Site	Lesion	No. of Cases	Percentage of Abnormal Endoscopic Findings
Oesophagus (Total 8)	Incompetent OG junction	3	12%
	Hiatus hernia	4	15%
	Oesophagitis	1	4%
Stomach (Total 21)	Antral gastritis alone	2	8%
	Nodular gastritis	1	4%
	Erosive gastritis (more than one part of the stomach)	19	73%
	Pan Gastritis (involving all 3 parts)	13	50%
Duodenum (Total 17)	Duodenitis	15	58%
	Duodenal ulcer	2	8%
Combined	Gastric and Duodenal erosions	7	27%
	Gastric, Duodenal, Oesophageal erosions	1	4%

**Table 1: Nature and Distribution of Endoscopic Lesions**

Lesion	Mild-to-Moderate Cases Percentage		Severe Cases Percentage		Total Cases (46)
H. pylori positive	31	82%	7	18%	38 (83%)
H. pylori negative	-	-	-	-	6 (14%)
Normal	-	-	-	-	2 (3%)
Lymphocyte infiltration	28	74%	10	26%	38
Neutrophilic infiltration	3	8%	1	3%	4 (10%)
Intestinal metaplasia	5	13%	-	-	5

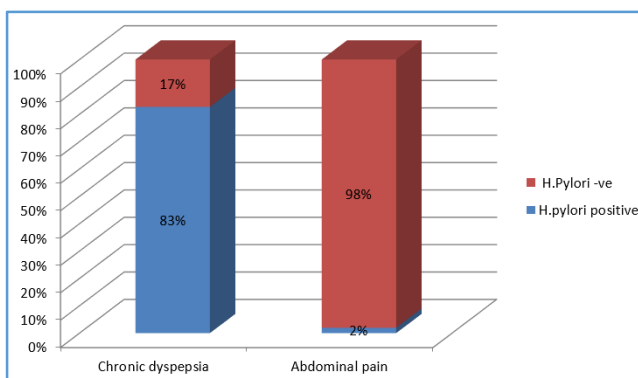
**Table 2: Antral Mucosal Biopsy Findings**



**Fig. 1: Out of 46 Patients 38 were Positive for H. Pylori**

	H. Pylori positive	H. Pylori - ve	Total
Chronic dyspepsia	38 (83%)	8 (17%)	46
Abdominal pain	4 (2%)	200 (98%)	204
<b>Total</b>	<b>42</b>	<b>208</b>	<b>250</b>

**Table 3**



**Figure 2**

<b>Odds Ratio</b>	<b>237.5000</b>
95 % CI:	68.0884 to 828.4269
z statistic	8.582
Significance level	P < 0.0001

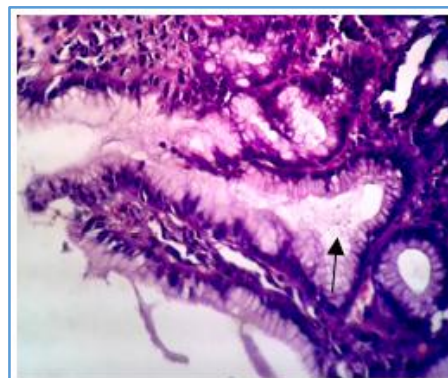
**Table 4**



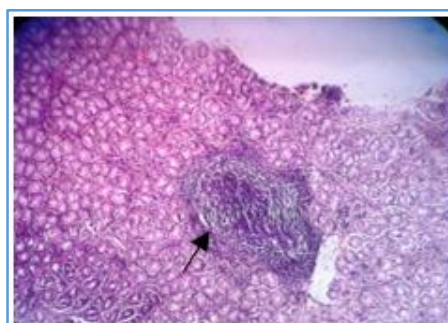
**Fig. 3: Endoscopic Photograph shows Body Erosions (Arrow)**



**Fig. 4: Endoscopic Photograph Shows Antral Erosions (Arrow)**



**Fig. 5: Photomicrograph Showing Rod-Shaped Helicobacter Pylori on Mucosal Surface (Arrow). (Hematoxylin and Eosin x 100)**



**Fig. 6: Photomicrograph Showing Gastric Mucosal Glands with Lymphoid Follicles (Arrow) (Hematoxylin and Eosin x 40)**

Duodenitis (58%) was the next common finding observed in our study (58%). Even though, endoscopy was normal in 43% of the children in our study, histopathology was abnormal in all children except in two cases and all were reported as chronic lymphocytic gastritis. H. pylori positivity was observed in 38 cases (83%). This was supported by Ozbey et al in their study, which showed 63.2% H. pylori positivity and Rajindrajith et al who had reported 65.8% H. pylori positivity and chronic lymphocytic gastritis as commonest histological appearance in their series.<sup>(8,13)</sup> Our study showed high H. pylori infiltration in 7/38 cases (18%), high lymphocytic infiltration in 10 cases (26%) and high neutrophilic infiltration in one case (11%). In our series, no atrophy of glandular mucosa was noted and intestinal metaplasia was noted in 5/38 cases (13%). But, Guarner et al in their series noted a high incidence of atrophy and/or

intestinal metaplasia in 12/19 (63%) *H. pylori* positive patients. Atrophy in eight (42%) cases, intestinal metaplasia in two (11%) cases, both atrophy and intestinal metaplasia in two (11%) cases.<sup>(5)</sup> Oliveira et al in their study found marked lymphocytic infiltration in <5% of their series, marked neutrophilic activity in <5% and marked *H. pylori* density in <11%. They did not note preneoplastic changes such as intestinal metaplasia, but noted mucosal glandular atrophy in 2/54 (4%) cases.<sup>(2)</sup> Mukadder et al have compared symptoms of *H. pylori* positive patients to *H. pylori* negative patients and found dyspepsia and halitosis to be significantly higher in *H. pylori* positive patients.<sup>(14)</sup> In our study, 84% children who underwent HPE for dyspepsia showed *H. pylori* positivity. It showed that there is a strong correlation of dyspepsia with associated *H. pylori* gastritis. (p value of 0.0001). *H. pylori* has been implicated in various illnesses apart from gastric and duodenal ulcers and other forms of chronic gastroduodenal pathology. They include failure to thrive, refractory iron-deficiency anaemia and other less well-established illnesses.<sup>(3,7)</sup> The increased association of under nutrition with dyspepsia noted in our study is a matter of concern to paediatricians as it may be a significant contributor to sluggish improvement in Millennium Development Goals (MDG).<sup>(15)</sup> So, the contribution of *H. pylori* gastritis to malnutrition in children between 5 to 15 years needs to be evaluated. Lydia et al have discussed that in 1994 *H. pylori* has been recognised as group 1 carcinogen and the most common aetiological agent of infection related cancer by WHO International agency for research on cancer.<sup>(4)</sup> Our study finding of increased association of *H. pylori* gastritis in rural dyspeptic children is really an alarming sign that it may lead to gastric malignancy later on. It is therefore suggested that further workup be done to assess the predisposing factors especially dietary habits for *H. pylori* gastritis in this rural children. Moreover, comprehensive clinical assessment of children presenting with chronic dyspepsia and upper gastroduodenal endoscopy may pick up this gastroduodenal pathology early. This will be useful for the early identification and treatment of *H. pylori* gastritis in childhood itself and that may decrease the later incidence of gastric malignancy.

**CONCLUSION:** The incidence of dyspepsia is common among children between the age group of 5-10 years and female children were commonly affected. The predominant symptom noted among this rural children is chronic abdominal pain and loss of appetite. We found that endoscopy has a very high pickup rate of gastroduodenal pathology and gastric erosions involving more than one part of stomach is a frequent finding followed by duodenal erosion in dyspeptic children. *H. pylori* associated gastritis is the overwhelming finding observed in these rural children with chronic dyspepsia.

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