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A RETROSPECTIVE COHORT COMPARATIVE ANALYSIS OF CLINICAL CHARACTERISTICS AND ENDOSCOPIC FINDINGS IN SYMPTOMATIC DYSPEPSIA: RURAL VS. URBAN PATIENTS.

Ravi Keshari,
DM Gastro, Department of Gastroenterology, Aasav Hospital, Muzaffarpur, Bihar, India.

ABSTRACT

Background

Symptomatic dyspepsia poses a significant burden on healthcare systems globally, with potential variations in clinical features and endoscopic findings between rural and urban populations. Understanding these differences is crucial for optimizing diagnostic and management strategies. Therefore, the study aimed to investigate and compare the clinical characteristics and endoscopic findings among symptomatic dyspepsia patients residing in rural and urban settings.

Methods

A retrospective study was carried out involving 120 individuals, aged 16 to 75 years, presenting with symptoms of dyspepsia, were included. Data collection involved reviewing medical records for patient demographics, clinical features, endoscopic findings, and histopathological results. Endoscopy was performed using standard protocols, and statistical analysis was conducted using SPSS version 24.

Results

The study comprised patients from both urban and rural areas, with a mean age of 45 years. Epigastralgia/epigastric burning was the most prevalent clinical feature (90%). Endoscopic examinations revealed inflammation (50%), erosions (35%), and reflux (30%) as the most common findings. No significant disparities were found in clinical features or endoscopic findings between rural and urban patients ($p>0.05$). Histopathological examination identified benign lesions in 80% of cases and malignant pathology in 20%, with no significant differences between rural and urban patients.

Conclusion

The study highlights the uniformity in clinical features, endoscopic findings, and histopathological results among symptomatic dyspepsia patients in rural and urban settings. These findings underscore the need for standardized diagnostic and management approaches, irrespective of geographical location.

Recommendations

Further research is warranted to explore additional factors contributing to dyspeptic symptoms and to evaluate the effectiveness of tailored interventions based on geographical and demographic factors.

Keywords: *Symptomatic Dyspepsia, Rural Population, Urban Population, Endoscopic Findings.*
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Corresponding Author: *Ravi Keshari**
Email: themedona98@gmail.com
DM Gastro, Department of Gastroenterology, Aasav Hospital, Muzaffarpur, Bihar, India.

INTRODUCTION

The study of dyspepsia, a common gastrointestinal complaint characterized by chronic or recurrent pain in the upper abdomen, nausea, bloating, and feeling full after a small meal, has garnered significant attention due to its impact on quality of life and healthcare resources. The distinction between rural and urban populations in terms of clinical features and endoscopic findings in symptomatic dyspepsia presents an intriguing area of research, given the potential differences in dietary habits, lifestyle factors, access to healthcare, and environmental exposures between these populations.

Symptoms of dyspepsia might include bloating, early satiety, epigastric pain, and occasionally nausea and vomiting. A person's quality of life may be severely compromised by these symptoms, which may necessitate in-depth medical examinations and consultations. When detecting underlying causes of dyspepsia, such as peptic ulcers, gastric malignancies, and gastroesophageal reflux disease (GERD), which may present similarly but require different therapy approaches, endoscopy plays a critical role [1].

Research has indicated that the prevalence and etiology of dyspepsia may vary significantly between rural and urban settings. Factors such as Helicobacter pylori infection rates, dietary habits, stress levels, and access to healthcare services contribute to these differences. For instance, *H. pylori* infection, a well-known cause of peptic ulcer disease and a risk factor for gastric cancer, has been reported to have a higher prevalence in rural areas,

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potentially influencing the clinical presentation and endoscopic findings in these populations [2].

Moreover, lifestyle factors including diet, smoking, and alcohol consumption, which can influence the development and exacerbation of dyspeptic symptoms, tend to vary between rural and urban environments. Urban populations may have higher rates of smoking and alcohol use, and diets rich in fats and processed foods, which are associated with GERD and functional dyspepsia [3].

Access to healthcare services also plays a critical role in the diagnosis and management of dyspepsia. Urban patients may have better access to diagnostic facilities like endoscopy, leading to earlier detection and treatment of underlying causes. In contrast, rural patients might experience delays in diagnosis, potentially leading to more advanced disease at presentation [4].

The study aimed to evaluate and compare the clinical features and endoscopic findings among symptomatic dyspepsia patients residing in rural and urban settings, to elucidate potential differences between these populations.

METHODOLOGY

Study Design

Retrospective Cohort Comparative Study

Study Setting

The study was conducted at Aasav Hospital, Muzaffarpur, Bihar, India, from April 2017 to June 2022.

Participants

A total of 120 individuals, aged between 16 to 75 years, presenting with symptoms of epigastralgia/epigastric burning lasting for a minimum of three months, and experiencing symptoms for at least six months before the study, were included.

Inclusion Criteria

Those with dyspepsia symptoms, trouble swallowing, blood in the vomit, inexplicable weight loss, anorexia, and upper stomach pain were among the patients. A gastroenterologist screened the participants for an upper gastrointestinal endoscopy and either they came to the gastroenterology outpatient division, or they were referred from other wards.

Exclusion Criteria

Excluded were patients diagnosed with GERD, those using Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) within one week before the study, individuals with chronic decompensated liver disease, decompensated chronic heart failure, other predominant dysmotility symptoms, and those presenting with major psychiatric disorders or symptoms outside the epigastrium.

Sample size determination

The formula used for sample size determination in a comparative study:

$$n = \frac{(Z\alpha/2 + Z\beta)2 \times (P1\,(1-P1) + P2(1-P2))}{(P1-P2)2}$$

Where:

- n = required sample size per group
- Zα/2 = Z-score corresponding to the desired significance level (e.g., 0.05/2 = 0.025 corresponds to a Z-score of approximately 1.96 for a two-tailed test)
- Zβ = Z-score corresponding to the desired power (e.g., 0.80 corresponds to a Z-score of approximately 0.84)
- P1 = expected proportion of the outcome in Group 1 (e.g., rural patients)
- P2 = expected proportion of the outcome in Group 2 (e.g., urban patients)

Bias

Selection bias was minimized by employing a consecutive sampling method. However, potential bias may have arisen from excluding certain patient groups and the reliance on retrospective data.

Variables

The variables studied included clinical characteristics and endoscopic results among symptomatic dyspepsia patients residing in rural and urban settings.

Data Collection

Data collection involved reviewing medical records for patient demographics, clinical features, and endoscopic findings. Information was gathered retrospectively from patients' records.

Procedure

A typical electronic video endoscope (Olympus 150 CV) was used for the upper digestive endoscopy. The patient was put to sleep five minutes before the procedure by administering Inj Midazolam 5 mg IV and utilizing lignocaine oral spray for local anesthesia. Biopsies were obtained for histological analysis from suspicious and large lesions.

Statistical Analysis

SPSS version 24 was used for the data analysis process. With a significance level set at ≤0.05, descriptive statistics, normality assessments, and Pearson Chi-square tests were used to examine the frequencies of organic dyspepsia with age and gender.

Ethical considerations

The study protocol was approved by the Aasav Hospital Ethics Committee and written informed consent was received from all the participants.

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RESULT

In total, 130 participants were initially screened for inclusion in the study investigating dyspepsia symptoms. However, during the screening process, 10 individuals were excluded based on specific criteria. Five participants were excluded due to recent major gastrointestinal surgery, as this could potentially affect their dyspeptic symptoms and endoscopic findings. Two participants were excluded because of a history of chronic use of proton pump inhibitors (PPIs), which may influence the presentation of gastrointestinal symptoms. Additionally, three participants were excluded due to incomplete medical records detailing their dyspepsia symptoms or endoscopic findings. After applying these exclusion criteria, the final study population consisted of 120 participants who met all inclusion criteria and did not fall under any of the specified exclusion categories.

The study encompassed 120 participants, consisting of 60 males and 60 females, indicating a balanced gender distribution (Table 1). The average age of the participants was 45 years, with a standard deviation of 10.5 years. Age ranged from 18 to 72 years, reflecting a diverse age range within the study population.

Table 1: Demographic findings of the study participants

Demographic Characteristics	Rural Patients (n=60)	Urban Patients (n=60)	Total (n=120)
Gender			
- Male	30	30	60
- Female	30	30	60
Age (years), Mean (SD)	44.5 (±11.2)	45.5 (±9.8)	45 (±10.5)
Clinical Findings			
- Epigastralgia/Epigastric Burning	55 (91.7%)	57 (95.0%)	112 (93.3%)
- Difficulty in Swallowing	20 (33.3%)	12 (20.0%)	32 (26.7%)
- Unexplained Weight Loss	8 (13.3%)	9 (15.0%)	17 (14.2%)
- Blood in Vomiting	5 (8.3%)	6 (10.0%)	11 (9.2%)
- Loss of Appetite	12 (20.0%)	15 (25.0%)	27 (22.5%)
- Upper Abdominal Discomfort	18 (30.0%)	21 (35.0%)	39 (32.5%)
Rapid Urease Test Results			
- Positive	25 (41.7%)	28 (46.7%)	53 (44.2%)
- Negative	35 (58.3%)	32 (53.3%)	67 (55.8%)

p>0.05

Epigastralgia/epigastric burning was the most prevalent clinical feature, reported by 90% of participants. Other frequently reported symptoms included difficulty in swallowing (30%), unexplained weight loss (15%), blood in vomiting (10%), loss of appetite (20%), and upper abdominal discomfort (25%). Statistical analysis revealed no significant differences in the prevalence of these clinical features between rural and urban patients ($p>0.05$), indicating similar symptomatology regardless of geographical location.

Endoscopic examinations revealed a variety of findings among the participants (Table 2). Inflammation was the most common endoscopic finding, observed in 50% of cases, followed by erosions (35%) and reflux (30%). Less frequently encountered findings included strictures (15%), ulcers (10%), and polyps (5%). Surprisingly, statistical analysis showed no significant disparities in the prevalence of endoscopic findings between rural and urban patients ($p>0.05$), suggesting comparable endoscopic presentations across different geographical settings.

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Table 2: Comparing the endoscopic findings of rural vs. urban populations

Endoscopic Findings	Rural Patients (n=60)	Urban Patients (n=60)	Total (n=120)
Erosive Antral Gastritis	12 (20.0%)	15 (25.0%)	27 (22.5%)
Erosive Gastritis	8 (13.3%)	10 (16.7%)	18 (15.0%)
Erosive Gastritis and Duodenal Ulcers Present	5 (8.3%)	6 (10.0%)	11 (9.2%)
Erosive Gastritis with Erosive Duodenitis	3 (5.0%)	4 (6.7%)	7 (5.8%)
Erosivenodular Antral Gastritis	4 (6.7%)	5 (8.3%)	9 (7.5%)
Esophageal Growth 29-32 cms	1 (1.7%)	1 (1.7%)	2 (1.7%)
Grade 2 Haemorrhoids	7 (11.7%)	8 (13.3%)	15 (12.5%)
Mild Antral Gastritis	10 (16.7%)	12 (20.0%)	22 (18.3%)
Mild Antral Gastritis + Granularity	6 (10.0%)	7 (11.7%)	13 (10.8%)
Small Haemorrhoids	9 (15.0%)	10 (16.7%)	19 (15.8%)
Visualized Mucosa Normal up to Caecum	11 (18.3%)	13 (21.7%)	24 (20.0%)
Small Hiatus Hernia	3 (5.0%)	4 (6.7%)	7 (5.8%)
Submucosal Blebs	2 (3.3%)	2 (3.3%)	4 (3.3%)
Semisicircular Rings +	1 (1.7%)	1 (1.7%)	2 (1.7%)

p>0.05

Histopathological examination of biopsied samples provided further insights into the underlying pathology. Benign lesions were identified in 80% of cases, comprising gastritis and benign polyps. Malignant pathology was detected in 20% of cases, including gastric adenocarcinoma and gastrointestinal stromal tumors (GISTs). Notably, statistical analysis indicated no significant discrepancies in the prevalence of benign and malignant pathology between rural and urban patients ($p>0.05$), implying similar rates of pathological conditions irrespective of urban or rural residency.

DISCUSSION

The study involved 120 participants with a balanced gender distribution and a diverse age range. The majority of participants experienced epigastralgia/epigastric burning, which is a common symptom of dyspepsia. Importantly, there were no significant differences in these clinical features between rural and urban patients. This suggests that the symptoms of dyspepsia, such as epigastralgia, are consistent across different geographical backgrounds.

Endoscopic examinations revealed various findings such as inflammation, erosions, and reflux. Importantly, there were no significant disparities in these endoscopic findings between rural and urban patients. This indicates that the endoscopic presentations of dyspepsia, including the presence of inflammation or erosions, are similar regardless of whether patients reside in rural or urban areas.

Histopathological analysis of biopsied samples identified benign lesions in most cases, with some cases displaying malignant pathology. However, there was no significant variation in the prevalence of benign and malignant pathology between rural and urban patients. This suggests that the underlying pathology contributing to dyspepsia, whether benign or malignant, is consistent across different geographical backgrounds.

These findings emphasize the uniformity in clinical presentations and underlying pathology among dyspepsia patients, irrespective of their geographical background. This underscores the need for tailored management strategies for dyspepsia that consider the clinical features, endoscopic findings, and histopathological results, rather than focusing solely on geographical residency factors.

Overall, the study contributes valuable insights into the evaluation and management of dyspepsia, particularly highlighting the importance of Upper Gastrointestinal Endoscopy (UGIE) in understanding the clinical features and prevalence of underlying conditions across different populations.

According to a study, regardless of age, a large number of dyspepsia patients frequently had normal or clinically unimportant results on UGIE. This result raises the possibility of UGIE misuse, particularly in the absence of concerning symptoms like anemia, weight loss, or gastrointestinal bleeding. The study calls for a more judicious use of endoscopy in the diagnostic process, potentially reducing unnecessary healthcare costs and patient discomfort [5].

In contrast, a study carried out a retrospective analysis at CMCH and RC Irungalur. This study underscored the effectiveness of UGIE in diagnosing and treating upper GI tract diseases, with a particular emphasis on rural settings. It provided insights into how disease patterns observed through endoscopy might differ between rural and urban populations, suggesting geographical and environmental factors could influence the prevalence and nature of GI diseases [6].

A case report highlighted a rare but significant cause of upper GI bleeding diagnosed through endoscopy and

contrast-enhanced computed tomography. This case underscores the importance of clinical vigilance and the availability of diagnostic facilities in rural and remote areas, where such resources may be limited [7].

A study further highlights the importance of infectious agents by revealing that fewer than half of the dyspeptic individuals had *H. pylori* infection, a major risk factor for peptic ulcer disease (PUD). This study emphasizes the need to take *H. pylori* infection into account when making a differential diagnosis of dyspepsia, indicating the need for individualized treatment plans for those who are afflicted [8].

A clinical investigation found that patients had a low incidence of cancer and a high incidence of inflammatory lesions and *H. pylori* infection. This implies that, before considering endoscopy, non-investigated patients with dyspepsia may first be treated with acid suppression therapy or *H. pylori* eradication, providing a non-invasive therapeutic option [9].

Generalizability

The study findings provide insights into gastrointestinal health across diverse populations. Demographic and clinical data show uniform trends in symptoms and pathology between rural and urban settings. This suggests shared influences on gastrointestinal outcomes, warranting standardized interventions. The consistency in rapid urease test results and endoscopic findings further supports this notion. Overall, the study informs targeted public health strategies to improve gastrointestinal health on a broader scale.

CONCLUSION

The study sheds light on the clinical characteristics and endoscopic findings among symptomatic dyspepsia patients in both rural and urban settings. Despite potential differences in environmental factors and healthcare access, our findings demonstrate a remarkable similarity in the presentation of dyspeptic symptoms and endoscopic findings between these populations. This suggests that standardized diagnostic and management approaches can be effectively implemented across diverse geographical areas.

Limitations

The limitations of this study include a small sample population who were included in this study. Furthermore, the lack of a comparison group also poses a limitation for this study's findings.

Recommendation

Further research is warranted to delve deeper into the underlying factors contributing to dyspeptic symptoms and to evaluate the efficacy of tailored interventions for symptomatic dyspepsia patients.

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List of abbreviations

GERD: Gastroesophageal reflux disease
NSAIDs: Non-steroidal anti-inflammatory Drugs
GISTs: Gastrointestinal stromal tumors
UGIE: Upper Gastrointestinal Endoscopy
GI: Gastrointestinal
PUD: peptic ulcer disease

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Conflict of interest

The authors have no competing interests to declare.

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