

A Study of Duodenal Biopsy in Patients with Anemia - An Experience at a Rural Based Tertiary Care Hospital

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Abstract: Background: Celiac disease is an immune-mediated enteropathy due to a permanent sensitivity to gluten in genetically susceptible people¹. Anemia is common and frequent presentation². patients with CD demonstrate small intestinal inflammation, villous atrophy, and this may result in malabsorption of both calories and micronutrients including iron³. This study was done to determine the association of biopsy proven celiac disease in patients of anemia. Aim: The aim of this study was to determine the celiac disease in patients of anemia. Method: This was a retrospective study conducted on 107, endoscopic duodenal biopsies received between September 2020 to August 2021 in the department of Pathology, at rural based tertiary care hospital in North India. Results: All 107 patients, 77.6% patients had MCV (<80 fl) and 22.42% patients had serum ferritin level <30ng/ml. Out of 107 patients 11 (10.28%) had celiac disease and 90.0% patients had no evidence of celiac disease. Discussion: Celiac disease is a relatively frequent finding in patients with anemia. Our study was in concordance with the studies done by Bhagbanian et. al.1 and Mahadev et. al.2, they found a prevalence of celiac disease in anemia patients was 10.4% and 5.5% respectively. Conclusion: HPE of endoscopic biopsies is an important diagnostic tool for patient with celiac disease for better patient treatment and management.

Keywords: Celiac disease, Mean corpuscular volume, Anemia

1. Introduction

Celiac disease (CD) or gluten sensitive disease is an immune-mediated enteropathy caused by a permanent sensitivity to gluten by taking nutrients such as wheat, barley, and rye in genetically susceptible individuals⁴. It is characterized by the presence of chronic inflammation of the small bowel's mucosa and submucosa that results in malabsorption of essential nutrients. Severity of iron malabsorption seems to be related to the extent of atrophy along the small bowel, seen in both in children and adults^{5,6}. Classic presenting features of CD include chronic diarrhea, abdominal distention, failure to thrive and weight loss⁷. Most individuals with CD have the silent or subclinical form, and the condition may present insidiously, for example with iron-deficiency anemia (IDA), osteoporosis, neurological symptoms or cryptogenic hypertransaminasemia⁷. The anemia in CD is usually due to malabsorption of micronutrients such as iron, folic acid, and vitamin B12. The main mechanism for IDA in CD is related to malabsorption, as the site of iron absorption the proximal duodenum is almost always involved⁸.

Anemia is a most frequent finding in patients with CD and may be the presenting feature. The anemia may be the only

abnormality identified. Anemia was particularly common in patients with untreated CD in the past but is still frequently present in undiagnosed adults. IDA resistant to oral iron supplementation is a most common extraintestinal manifestation of CD and has been described as the sole manifestation of the disease without overt malabsorption⁴. The absorption of dietary iron occurs in the proximal small intestine and it depends upon several factors, including an intact mucosal surface and intestinal acidity. The iron deficiency is primarily attributed to the enteropathy characterized by mucosal damage of the small intestine that results in impaired absorption of iron, but there may also be occult blood loss in the gastrointestinal tract. If symptomatic, correction of anemia can be done by intravenous iron; otherwise, it usually restores in parallel with the histological recovery of atrophic mucosa on gluten-free diet⁹. IDA usually manifests as microcytic, hypochromic anemia and patients characteristically have low levels of serum iron, elevated total iron-binding capacity, and low ferritin levels. A number of endoscopic findings have been described in patients with CD, namely a mosaic pattern of the duodenal mucosa, reduction or loss of duodenal (Kerckring's) folds, scalloping of valvulae conniventes, a nodular pattern of the bulbar mucosa, visible

submucosal blood vessels. Coarse, notched, or scalloped duodenal folds have also been reported in CD¹⁰.

2. Material and Methods

This was a retrospective study conducted on 107 endoscopic duodenal biopsies received in the department of Pathology, at rural based tertiary care hospital in North India and done between September 2020 to February 2021. Demographic data like age, sex and hematological parameters like Hb, MCV, Serum ferritin and endoscopic finding were noted and correlated with histopathological diagnosis. Criteria for mild, moderate and severe anemia was taken as Hb >10 mg/dl, 5-10 mg/dl, and <5 mg/dl respectively. In this study clinically symptomatic, biopsy proven CD cases with anemia were included and patients with chronic disease, hemorrhagic diathesis, or any other blood disease were excluded.

3. Result

Most of the cases 32/107 (29.9%) were in the age group between 21-30 years, there is female predominance in 65/107 (60.7%) with M: F ratio of 1: 1.5. Based on clinical data collected, all 107 cases presented with persistent diarrhea, 39/107 (36.4%) cases presented with weakness as well. Among the hematological parameters 97/107 (84.1%) patients had moderate anemia, 8/107 (7.5%) had mild anemia, and 2/107 (1.9%) had severe anemia. Further 83/107 (77.6%) patients had MCV <80fl and 24/107 (22.42%) patient had serum ferritin levels <30ng/ml. 8/107 (7.5%) patient's, serum ferritin level could not be assessed as data was not available. Based on the endoscopic findings,

39/107 (36.4%) patients had scalloping with decreased duodenal folds and 2/107 (1.9%) showed reduced duodenal folds with duodenal lymphangiectasia and 66/107 (62.70%) patients had normal study. On histopathology 11/107 (10.28%) cases were diagnosed as CD, and 96/107 (90.0%) of cases had no evidence of celiac disease on biopsy. Demographic data on CD cases of the study are given in fig 1 and 2.

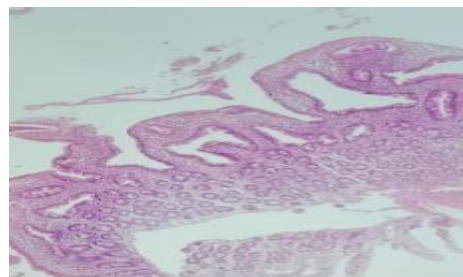


Figure 1: Showing well oriented duodenal biopsy (H&E 10X)

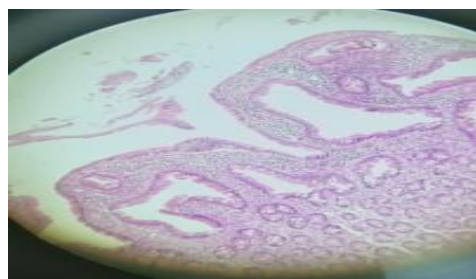


Figure 2: Showing villous atrophy and intraepithelial lymphocytes

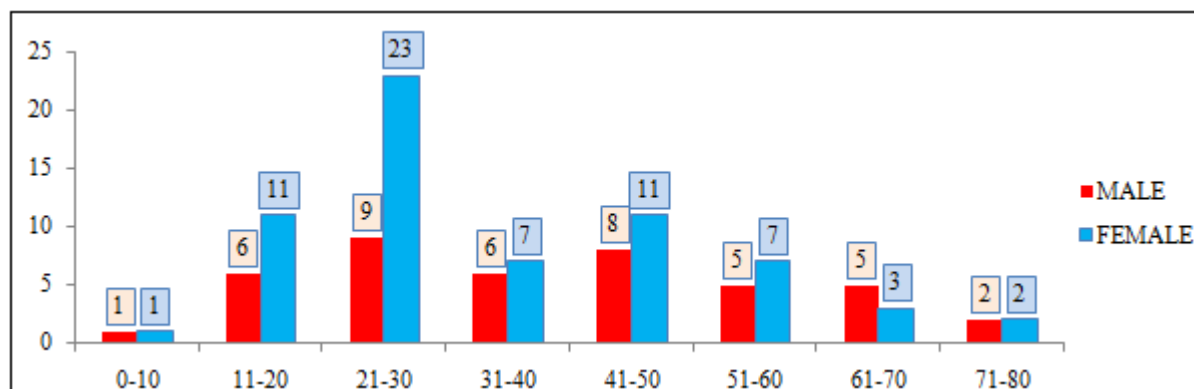


Fig 3 showing, relation between number of cases and age distribution in which most of the cases (29.9%) were in age group of 21-30 years of age.

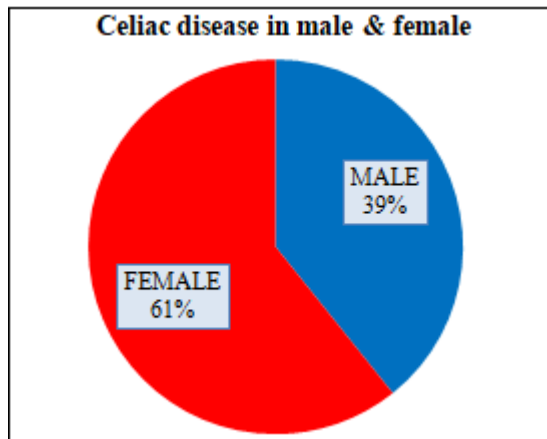


Figure 4

Figure 4: showing, female predominance as compared to male patients.

Table 1: Gender wise distribution of histopathologically proven cases of celiac disease:

Gender	Frequency	Percentage
Male	03	2.80%
Female	08	7.4%
Total	11	10.28%

Table 1 shows, out of 11 celiac disease positive cases 8 patients were female and 3 patients were male.

Table 2: Age wise distribution of histologically proven cases of celiac disease

Age group	Frequency	Percentage
21-30	5	4.7%
31-40	0	0
41-50	3	2.8%
51-60	1	0.9%
61-70	0	0
71-80	2	1.9%
81-90	0	0
Total	11	10.28%

Table 2: Shows, out of 11 positive patients, maximum patients were in the age group of 21-30 years of age, followed by 41-50 years of age.

4. Discussion

Celiac disease is an immune-mediated enteropathy due to a permanent sensitivity to gluten in genetically susceptible people¹. Anemia is common and frequent presentation². patients with CD demonstrate small intestinal inflammation, villous atrophy, and this may result in mal-absorption of both calories and micronutrients including iron³. The age group showing maximum number of cases 29.9% (32/107) was between 21 to 30 years, showed a female predominance (60.7%) with a male: female ratio of 1: 1.5, these results were similar to study by baghbanina et al¹. All the study participants were anemic as confirmed by their Hb levels. In this study, we found that the serum ferritin levels in 22.4% patients was below 30 ng/ml, which is contrasting with the results of the study conducted by Berry et al which showed same levels in 66% (68/103). A similar features which showed concordance between our study and Berry et al¹¹

was that the degree of anemia was proportional to the severity of villous atrophy, but showed discordance with Herper et al study¹². In our study 77% (83/107) patients had MCV <80 fl which is similar to study by Berry et al, in which 66% (68/103) patients showed similar results¹¹.

In this study biopsy proven celiac disease cases were 10.3% (11/107). In which 8 cases were female and 3 cases were male. Maximum number of cases were in the age group of 21-30 years followed by 41-50 years of age, which showed discordance with the studies of Howard et al¹³ with 4.7% (12/258) cases of celiac disease with male predominance and maximum cases in the age group of 41-50 years.

The endoscopic finding of upper GIT in anemic patients in our study showed normal study in majority of cases that is 62.7% (66/107), this results was contrasting with result of study by Baghbanian et al, in which majority of patients that is 92.9% endoscopic study revealed scalloping with reduced duodenal folds¹.

5. Conclusion

Celiac disease could be possible reason of anemia especially in the age group of 21-30 years of age. We found that 11 in 107 patients with anemia had histological evidence of celiac disease. So, HPE of endoscopic biopsies is an important diagnostic tool for patient with celiac disease for early diagnosis and better patient treatment and management.

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