CORRELATION OF ENDOSCOPIC AND HISTOLOGICAL CHANGES IN PATIENTS WITH SUSPECTED CELIAC DISEASE

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Abstract

Background: During endoscopic examination of the upper gastro-intestinal tract, some endoscopic changes in the duodenal mucosa may suggest Celiac disease.

Patients and method: We studied 102 patients, referred to the endoscopy unit for evaluation of the possibility of Celiac disease. All patients underwent upper gastrointestinal endoscopy and biopsy specimens were taken from the descending duodenum and sent for histopathological study.

Results: The main symptoms of patients were short stature and chronic diarrhea. Atrophic duodenal mucosal folds and scalloping of the valulae conniventes were found in 31 of 34 patients with subtotal villous atrophy. The sensitivity and specificity of this result were 91 percent and 75 percent respectively.

Conclusion: For early diagnosis of celiac disease biopsy study of the duodenal mucosa should be done in all patients when there are endoscopic changes in the duodenal mucosa like atrophic mucosal folds and presence of scalloping of the valvulae conniventes.

Key words: Celiac Disease, Endoscopy, Histological Changes

Iraqi J Med Sci, 2004; Vol. 3 (1): 51-54

Introduction

Celiac disease, also termed celiac sprue and gluten sensitive enteropathy is a disease in which there is malabsorption of nutrients by that portion of the small intestine, a characteristic, although not specific lesion of the small intestinal mucosa; and prompt clinical improvement after withdrawal of certain cereal grains from the diet.

It is likely that many patients are not diagnosed because symptoms are mild or absent[1,2], and because the indication for intestinal biopsy do not take account of the full range of presenting symptoms[3].

In fact studies have suggested that the majority of adults with celiac disease do not have symptoms of overt malabsorption[3-5], and diagnosis in such patients with only transient or unrelated symptoms is particularly difficult and elusive.

Despite the widespread use of fiberoptic endoscopy in the examination of the upper gastrointestinal tract for a variety of symptoms, reports of endoscopic observations in celiac disease are few[6-9] and endoscopically, no characteristic changes has been described. Scalloping or absence of duodenal folds has been noted in some patients with celiac sprue[10,11] and if present should alert the endoscopist to the possible diagnosis.

In this study we describe some of the endoscopic changes in the duodenal mucosa in patients with suspected celiac disease and correlate these changes with the histological alterations.

Patients & Methods

In the period between January 2001 to January 2002, we studied 102 patients referred to the endoscopy unit in Al-Kadhimiya Teaching Hospital with suspicion of celiac disease. History was taken from the patients regarding age, sex, main symptoms and associated diseases.

All patients underwent upper gastrointestinal endoscopy under local anasthesia and medozolam sedation, 5 mg given intravenously. Endoscopic findings were recorded and multiple biopsy specimens taken from the descending duodenum. The specimens were placed on a piece of filter paper and fixed in 10 percent formal saline. All specimens were routinely processed and embedded on edge in paraffin wax. Sections 4 to 5 micrometer (μm) thick were taken, and stained with hematoxylin and eosin and examined under a light microscope by observer unaware of the pattern of the mucosal folds in the patients. The slides were graded as normal (i.e. showing finger shaped or leaf shaped villi) or as showing partial villous atrophy (i.e. with the villous-like structure still

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Received 17th November 2002: Accepted 19th January 2004.

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detectable) or subtotal villous atrophy (i.e. with the villi no longer detectable)[12].

The sensitivity, specificity, and positive and negative predictability of this finding in celiac disease were calculated according to the methods of Foster *et al*[13].

Results

The demographic of the study group were listed in table 1, which showed that the mean age of patients were 16.1 year and the male/female ratio was 1.7:1, and the main symptoms were short stature and chronic diarrhea. Four of the patients were insulin dependant diabetes mellitus.

Table 1: Patients demographic data

Characteristics	Data
Total No. of patients	102
Mean age (range) years	16.1 (2.5-38)
Male/female ratio	64/38 (1.7:1)
Main Symptoms	
Short stature	71 (70%)
Chronic diarrhea	16(15.7%)
Weight loss	8(7.8%)
Anemia	5(4.7%)
Osteomalicia	1
Dermatitis herptiforms	1
Associated diseases	
IDDM	4
Turner's syndrome	1

Table 2 showed the endoscopic findings of all patients. Forty one patients had atrophic duodenal mucosal folds and seven had scalloped valvulae conniventes with patchy areas of pale mucosa alternating with more erythematous mucosa, the pale areas had a pronounced mosiac appearance.

Table 2: Endoscopic findings

Endoscopic Features	Number
Normal	43
Atrophic duodenal mucosal folds	41
Scalloped valvulae conniventes	7
Duodenitis	9
Duodenal Ulcer	2
Total	102

Table 3 showed the final histological diagnosis of the studied patients. Subtotal villous atrophy were diagnosed in 34 patients, partial villous atrophy in 27 patients, non specific duodenitis in 25 patients and 16 patients were reported as normal.

Table 3: Histological Findings

Histological Diagnosis	Number
Subtotal villous atrophy	34
Partial villous atrophy	27
Non specific duodenitis	25
Normal	16
Total	102

Table 4 demonstrated the correlation of the endoscopic and histological findings. Of the 48 patients with atrophic duodenal mucosal folds and scalloped valvulae conniventes on endoscopy, 31 had subtotal villous atrophy and the remaining had partial villous atrophy or duodenitis.

The loss of duodenal mucosal folds and the presence of scalloped valvulae conniventes were found in 31 of the 34 patients with subtotal villous atrophy and in 17 of 68 patients with partial villous atrophy, duodenitis and normal mucosa.

Table 4: Correlation of endoscopic to histological findings

Endoscopic findings	No.	Histological diagnosis	No.
Normal	43	Partial villous atrophy	18
		Normal	14
		Duodenitis	9
		Subtotal villous atrophy	2
Atrophic duodenal mucosal folds	41	Subtotal villous atrophy	27
		Duodenitis	8
		Partial villous atrophy	6
Duodenitis & duodenal ulacer	11	Duodenitis	7
		Normal	2
		Subtotal villous atrophy	1
		Partial villous atrophy	1
Scalloped Valvulae conniventes	7	Subtotal villous atrophy	4
		Partial villous atrophy	2
		Duodenitis	1
Total	102	Total	102

Table 5 showed the correlation of histological to endoscopic findings. From this table and table 4 we can calculate the sensitivity of the loss or

marked reduction in the duodenal mucosal folds and presence of scalloped valvulae connivente, for the diagnosis of subtotal villous atrophy to be 91 percent, and the specificity 75 percent. The procedure had a positive predictive value of 64.6 percent and a negative predictive value of 95 percent. The overall accuracy was 80 percent.

Table 5: Correlation of histological to Endoscopic findings

Histological diagnosis	No.	Endoscopic findings	No.
Subtotal villous atrophy	34	Atrophic duodenal muocosal folds	27
		Scalloped valvulae coniventes	4
		Normal	2
		Duodenitis	1
Partial villous atrophy	27	Normal	18
		Atrophic duodenal muocosal folds	6
		Scalloped valvulae coniventes	2
		Duodenitis	1
Non specific duodenitis	25	Normal	9
		Atrophic duodenal muocosal folds	8
		Duodenitis & duodenal ulcers	7
		Scalloped valvulae coniventes	1
Normal	16	Normal	14
		Duodenitis	2
Total	102	Total	102

Discussion

Few studies have been reported concerning the endoscopic appearance of the proximal duodenal mucosa in celiac disease. In the earliest report, which describes a patient with celiac disease and a gastrojejunostomy, the authors observed a diffusely erythematous mucosa without ulceration or friability[7]. No other mucosal abnormalities were noted, and the authors concluded that it was unlikely that a diagnosis of celiac disease could be made based solely on evidence obtained at duodenoscopy[7].

Stevens and McCarthy[8] have claimed that severe villous atrophy is detectable endoscopically, especially after scattering of contrast media; they noted severe atrophy of the mucosa in the duodenal cap and a mosiac pattern in 7 of 11 untreated celiac patients.

Other studies have confirmed the usefulness of duodenoscopy in obtaining biopsy specimens for the diagnosis of small bowel disorders including celiac sprue[14,15] but have not commented on the appearance of small intestinal mucosa at time of endoscopy.

In the study of Brocchi *et al*[10], 15 of 17 patients with subtotal villous atrophy had a loss of kerckring's folds in the descending duodenum or a marked reduction in their number, and in 8 of 48 patients with partial villous atrophy or normal mucosa. The sensitivity and specificity of a loss or reduction of folds for the diagnosis of subtotal villous atrophy were 88 percent and 83 percent respectively. This result is comparable with our result of the reliability of endoscopy for diagnosis of celiac disease. In our study the sensitivity and specificity for atrophic duodenal mucosal folds and scalloping of the valvulae conniventes for the diagnosis of subtotal villous atrophy were 91 percent and 75 percent respectively.

In Jabbari *et al* study[11] they stated that the scalloped configuration of the valvulae conniventes has served as a consistently recognizable feature marking the underlying mucosal changes.

The diagnosis of early celiac sprue may be difficult to establish and often requires a high index of suspicion, as the presenting clinical feature may be subtle[16]. This may relate in part to initially limited involvement of only the proximal small bowel[17], and the functional reserve of the ileum, which can compensate for malabsorption occurring in the proximal small bowel[18].

The main problem in our patient was short stature, 71 patients (70%), this is because most patients were referred from endocrinology clinic to exclude malabsorption syndrome.

Other indications were chronic diarrhea, 16 patients (15.7%), 4 of them were insulin dependant diabetes mellitus. The remainder presented with unexplained anemia. One patient presented with osteomalacia and another one with dermatitis herpitiformis.

Characteristic endoscopic mucosal abnormalities were noted in 59 (58%) of patients, 57 (96%) of them had histological abnormalities.

According to this result when there is characteristic endoscopic finding observed unexpectedly, biopsy evaluation of the mucosa should also be carried out. By doing so, the diagnosis of celiac disease will be reached earlier, and avoiding complications that may occur with advanced stage of the disease.

So we recommend that all patients undergoing upper gastrointestinal endoscopy, should have the second part of the duodenal mucosa examined for a loss or reduction of duodenal folds and for the presence of scalloping of valvulae conniventes.

If these changes observed, duodenal mucosal biopsy should be performed since according to our study will assist in diagnosis of 91 percent of the patients with subtotal villous atrophy.

Conclusion

Celiac disease has a characteristic endoscopical change in the duodenal mucosa like atrophic duodenal mucosal folds and scalloping of the valvulae conniventes. For early diagnosis of celiac disease biopsy evaluation of abnormal looking mucosal folds is essential.

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