Portal Hypertansive Gastropathy and Helicobacter Pylori: An Endoscopic and Histopathologic Study

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Summary: *Portal hypertensive gastropathy (PHG) is a frequent endoscopic finding in portal hypertension (PHT). It is believed that PHG is responsible for nearly 20% of bleeding episodes in PHT. The cause of this endoscopic view is mucosal and submucosal capillary dilatation and venous congestion. The reports about Helicobacter Pylori (HP) prevalence in PHG are conflicting.*

We investigated the relation between the endoscopic view and capillary dilatation and the role of the gastric colonization of HP in PHG.

The study included 41 patients with PHT with different aetiologies. Endoscopic, histopathologic and microbiologic examinations were performed by the same researchers. Endoscopic evaluations were made according to McCormick's classification. HP was searched by cultures, direct microscopy and urease test.

PHG was found in 26 cases with PHT. It was mild in 3, moderate in 20 and severe in 3. In 21 of these cases with endoscopical PHG, histopathology also revealed mucosal capillary dilatation. There was inflammation in four cases and capillary dilatation in two cases with normal endoscopic appearance.

Gastric mucosa was normal both endoscopically and histopathologically only in 9 cases. HP was found 11 of the cases with PHG (42.3 %) and 4 of the cases without PHG (26.6%). The results show that capillary dilatation is important but HP has no role in PHG.

Key Words: Portal Hypertensive Gastropathy, Helicobacter Pylori.

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Upper gastrointestinal bleeding is a serious and potentially life-threatening complication in patients with PHT. Esophageal varices are responsible for approximately 80 % of episodes of bleeding in these patients (1). In endoscopic studies of patients with PHT presenting with gastrointestinal bleeding the prevalence of bleeding from gastric mucosal lesions has been estimated to be between 10% and 60% (2,3). Gastric mucosal lesions are frequent endoscopic findings in patients with PHT and for these lesions, the term "portal hypertensive gastropathy" are used because these are peculiar to PHT (4,5). Although the pathogenesis of PHG is controversial, it is suggested that the underlying alteration is venous congestion and capillary dilatation in the gastric mucosa and the submucosa (6,7). PHG differs histologically from inflammatory gastritis (7). Mucosal congestion makes the mucosa more susceptible to damage and reduces its repair capacity (8). Thus, gastric mucosa easily injures from agents such as bile acids, aspirin or alcohol.

The role of HP in the gastric mucosa in PHT has still to be fully evaluated, but recent evidences doesn't suggest that it plays a major pathogenic role (6,9).

Some authors reported that PHG remarkably increased after sclerotherapy (7,9), but others observed no correlation between PHG and previous endoscopic sclerotherapies (2,4,6).

Aims of this study were to assess the prevalence of PHG in PHT, the relation between endoscopic and histologic appearances, the role

of HP in pathogenesis, the relation between PHG and previous endoscopic sclerotherapies, degree of severity of liver damage, degree of esophageal varices.

PATIENTS and METHODS

Forty-one patients suffering PHT of different aetiologies were included in this study. Their mean age was 44.8 years (range 18-65 years) and 28 were male. The aetiology of PHT was cirrhosis in 37 (posthepatic 30, alcoholic 3, cryptogenic 3) and portal vein thrombosis in 4 patients.

Liver functions were assessed and graded according to Child's Grading System (21 child A, 15 child B, 5 child C). Twenty-two patients was previously treated with endoscopic sclerotherapy. One patient had optimal sclerosis, 21 patients have been going on sclerotherapy. Twenty-five patients had upper gastrointestinal system bleeding. Relevant clinical data at admission are reported in Table 1.

Endoscopic examination was performed using Olympus XQ 20 or 1T 10 endoscopes and standard 5 mm biopsy forceps. The severity of endoscopic gastropathy was graded as McCormick's Classification (6) that a modification of the classification previously employed by McCormack et al (7)). A four point scale was used as follows:

None= normal appearances;
Mild= mosaic or snake skin appearance; (mosaiclike pattern-Figure 1)
Moderate= presence of erythema; (scarlatinelike pattern-Figure 2)
Severe= Presence of erosions or hemorrhagic gastritis (Figure 3)

For each patient two biopsy specimens were taken from antrum mucosa within 4cm from of the pylorus and two from the body of the stomach on the grater curvature. Multiple sections from each biopsy specimens were stained with hematoxylin-eosin dye to evaluate the mucosal vascular changes. All specimens were evaluated by the same pathologist who wasn't aware of the clinical diagnosis of the patients. Mucosal vascular congestion was considered present if observed in any two biopsy specimens. The severity of histologic PHG was graded as absent (0); mild (+): one to three dilated ectatic capillaries in the deeper parts of lamina propria; moderate (++): more then three dilated ectatic capillaries limited to the deeper parts of lamina propria (Figure 4); or severe (+++): prominent dilated ectatic capillaries even in the superficial lamina propria (4). Congestive changes were analyzed in relation to the severity of PHG.

Table I: Clinical data of patients.

No. of patients	41
Age (yr)	44.87
Males/Females	28/13
Aetiologies of PHT	
Cirrhosis	37
Portal vein thrombosis	4
Aetiologies of cirrhosis	
Posthepatic	30
Alcoholic	3
Cryptogenic	4
Child class	
A	21
B	15
C	5
Esophageal varices	
Absent	13
1°	7
2°	10
3°	11
Previous sclerotherapy	21

HP was evaluated only for the antral biopsy specimens by Giemsa stain, culture and urease test. It was blindly examined by the same bacteriologist.

Statistical analysis was performed using the chisquare test. Yates correction was done.

RESULTS

Endoscopy

Gastric mucosal changes were found in 26 of 41 patients (63.4%). Three (7.4%) had mild, 20 (48.7%) had moderate, 3 (7.3%) had severe PHG. Esophageal varices were found in 28 patients. Seven had 1°, 10 had 2°, 11 had 3° PHG were found in 16 (57.14%) of these 26 patients and 10 (76.9%) of 13 patients who had

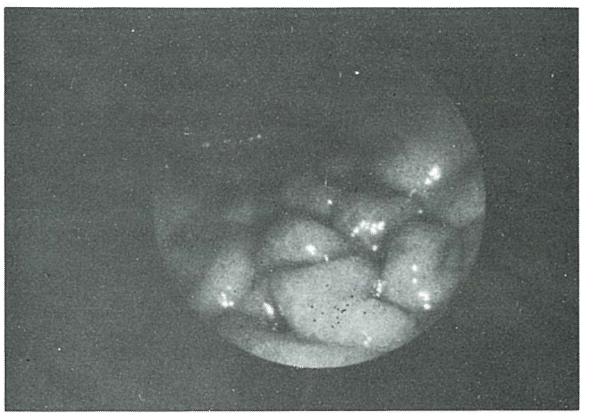

Figure 1: Mild PHG. Endoscopic view of gastric corpus with mosaiclike pattern.

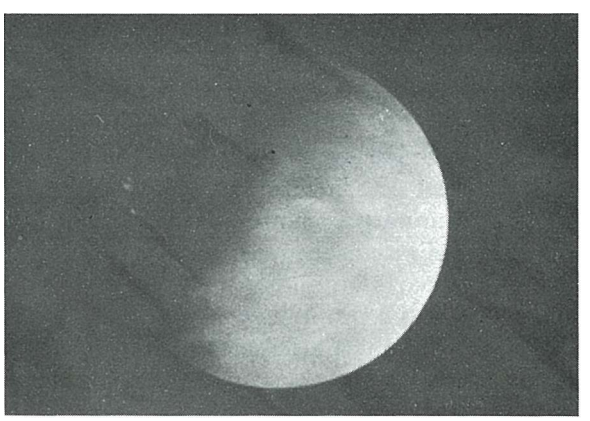

Figure 2: Moderate PHG. Endoscopic view of gastric antrum with scarlatinalike mucosal pattern.

Figure 3: Severe PHG. Endoscopic view of gastric fundus with cherry-red spots.

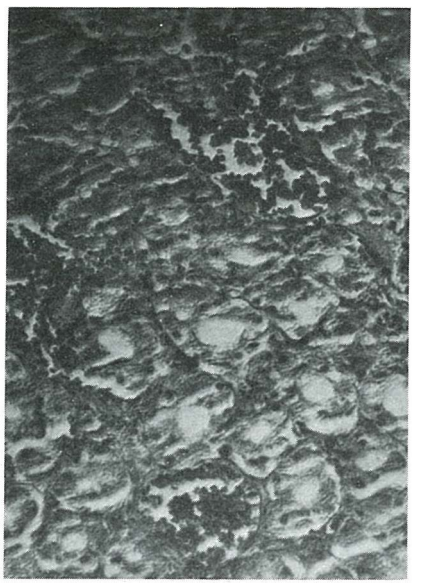

Figure 4: Dilated capillaries in the antral mucosa of one patient with moderate PHG.

Table II: Presence and severity of PHG according to Esophageal Varices

	Portal Hypertensive Gastropathy (PHG)							
	Absent		Mild		Moderate		Severe	
	No	(%)	No	(%)	No	(%)	No	(%)
Varices								
Absent	3	(20)	2	(66)	7	(35)	1	(33)
1°	2	(13)	0	(0)	4	(20)	1	(33)
2°	6	(40)	0	(0)	3	(15)	1	(33)
3°	4	(26)	1	(33)	6	(30)	0	(0)
X^2= 3.475			P= 0.3240				(D. F. = 3)	

not esophageal varices. There was no relation between the grade of varices and endoscopic features of PHG (p= 0.32)

Upper gastrointestinal bleeding were from esophageal varices in 21 (84%), from PHG in 4 (16%).

Before they were accepted for our study group

Table III: Presence of PHG according to sclerotherapy

	Sclerotherapy (+)		Sclerotherapy (-)	
PHG	No		No	(%)
+	13	/62)	3	(42.8)
	8	(38)	7	(47.2)
X^2= 0.778	P= 0.3778		(D.F.= 1)	

Table IV: Presence and Severity of PHG According to Child Class.

	Portal Hypertensive Gastropathy (PHG)							
	Absent		Mild		Moderate		Severe	
	No	(%)	No	(%)	No	(%)	No	(%)
Child Class								
A	11	(54)	1	(4)	8	(38)	1	(4)
B	3	(20)	0	(0)	11	(73)	1	(6.6)
C	1	(20)	2	(40)	1	(20)	1	(20)

X^2= 0.475 P= 0.1760 (D.F.= 2)

22 patients had endoscopic sclerotherapy. Eradication of varices was achieved in one patient and treatment had been going on in 21 patients. PHG was found in 13 (62%) of these 21 patients and in 3 (42.8%) of 7 patients who had not received previous sclerotherapy (Table 3). Prevalence of PHG didn't seem to be related to previous endoscopic sclerotherapy (p= 0.3778).

PHG was found in 11 patients classificated as (52.3 %) child A, 12 (80%) as child B, 4 (80%) as child C (Table 4). There were no correlation between the severity of the liver damage and PHG (p= 0.176).

PHG occurred in PHT of all aetiologies and proportion of patients who developed PHG in each of the etiological groups was not significantly different (Table 5).

Histology

Endoscopic gastric biopsies were performed on patients all with PHG and 15 without mucosal changes. In patients without PHG, in 4 cases mild inflammation and in 2 cases, mild mucosal congestion (13.3 %) were found. In patient with PHG, mucosal congestion was found 80.76 %. The correlation between PHG and mucosal congestion was significant. Inflammation was rarely found. Mild congestion in 2, moderate congestion in 16, severe congestion in 3 of patients were found with endoscopic gastropathy (Table 6). The presence or the severity of histological gastritis didn't seem to influence the degree of mucosal congestion. There was no correlation between degree of PHG and mucosal congestion or histological gastropathy.

Table V: Presence of PHG According to Etiologies of Portal Hypertension

	Portal Hypertensive Gastropathy (PHG)	
		No
Cirrhosis	23	62
Portal vein thrombosis	3	75

X2= 0.256 P= 0.6126 (D.F.= 1)

Table VI: Endoscopic Gastropathy Grade According to The Degree of Mucosal Congestion

	Mucosal Congestion							
	Absent		Mild		Moderate		Severe	
Endoscopic	No	(%)	No	(%)	No	(%)	No	(%)
Gastropathy								
Absent	9	(60)	1	(33)	4	(20)	0	(0)
Mild	4	(26)	0	(0)	7	(35)	2	(66)
Moderate	0	(0)	2	(66)	5	(25)	0	(0)
Severe	2	(13)	0	(0)	4	(20)	1	(33)

X^2= 16.76 P= 0.0526 (D.F.= 9)

Helicobacter Pylori

HP was found in 4 of 15 patients (26.6%) without PHG, 11 of 26 (42.3 %) with PHG. One of three patients has mild PHG, 8 of 26 (42.3%) have PHG. One of three patients with mild PHG, 8 of 20 patients with moderate PHG, 2 of 3 patients with severe PHG showed the presence of HP (Table 7). There was no relation between PHG and HP (p= 0.3166).

DISCUSSION

PHG is common endoscopic finding in PHT. Papazian et al. noted that the mosaic sign was found 94% in PHT, 0.3% in control subjects (5). Some investigators report a tendency

Table VII: Prevalence of Helicobacter Pylori (HP) in Relation to The Degree of Endoscopic Gastropathy

	Endoscopic Gastropathy			
	None	Mild	Moderate	Severe
HP+/Total (%)	4/15 (26.6)	1/3 (33)	8/20 (40)	2/3 (66)

X^2= 1.003 P= 0.3166 (D.F.=1)

for PHG to occur in the gastric fundus (5-7). This has a practical importance since such changes may readily be missed if the gastroscope is not retroverted in order to examine this relatively inaccessible area. D'Amico et al. were found PHG in 58 of 212 PHT patients (27 %) and followed up this patients 46 months. At the end PHG was developed 91% of patients (9). In our study PHG was detected 63.4% of patients with PHT.

The importance of PHG lies in the fact that it has been noted to be responsible for 20% of upper gastrointestinal bleeding 52). We found this ratio 16 %. The relation between sclerotherapy, presence and size of esophageal varices and PHG was investigated by many authors (4-9). D'Amico et al. Reported sclerotherapy presence and size of esophageal varices were significant risk indicators of PHG, suggesting that PHG was related to the severity of PHT (9). McCormack et al. observed that PHG was appeared during the course of sclerotherapy and in some patients even before eradication of varices (7). The mechanism of why sclerotherapy could increase the risk of PHG remains unclear. It can be hypothesized that by reducing or abolishing the collateral blood flow through varices, sclerotherapy can contribute to the gastric mucosal congestion of patients with PHT. McCormick et al. found that the severity of PHG didn't seem to be related to a history of previous endoscopic sclerotherapy (6). In our study confirms no relation between PHG and sclerotherapy.

Although McCormick et al. have found no correlation between PHG and the degree of severity of liver damage (7), D'Amico et al. have found that PHG was occured more commonly in patients with more advanced liver damage as assessed by the Child-Pugh System (9). We found no relation between PHG and the degree of severity of liver damage. Once again it might be the length of duration of PHT rather than the severity of the liver damage which was determined the prevalence of PHG (10).

Misra et al. have found the incidence of the mosaic sign was higher in patients with cirrhosis than in those with extrahepatic portal vein obstruction (4). We have found with comparable frequency in cirrhosis of all aetiologies and it has also been found in non-cirrhotic PHT.

Changes in the gastric mucosal vasculature assessed by examining surgical and autopsy specimens, were prompted McCormack et al. to distinguish PHG from inflammatory gastritis (7). The most consistent findings are dilatation of the submucosal veins, which are tortuous and irregular, showing foci of intimal thickening. Mucosal vessels also show abnormalities with capillary ectasia. Morphometric studies have confirmed the capillary dilatation and the presence of gastric red spots corresponds with extravasation of red blood cells through defective region in the epithelium as well as between intra epithelial spaces (6). Misra et al. were found that mucosal congestion was 72% in PHG, 59% in control subjects (4). In this study there was no correlation between endoscopic and histologic evidence of PHG. Similarly there was no correlation between the severity of mucosal vascular congestion and the degree of inflammatory changes observed in the biopsy specimens both in the control and in patients with PHT. McCormick et al. showed that the mucosal capillaries in patients with PHT were significantly dilated compared with control subjects but the degree of dilatation was not related to the severity of the endoscopic appearances. In our study, mucosal capillary dilatation was higher in patients with PHG than without PHG. But there was no correlation between degree of mucosal congestion and PHG. This results were suggested that mucosal congestion was a necessary but not sole prerequisite for the development of the endoscopic appearances of PHG. The degree of capillary dilatation was related to the severity of endoscopic appearances.

Mucosal congestion in PHT is seemed not only in stomach, but also in small bowel (11) and colon (12). Mucosal changes in colon of patients with PHT is termed "portal colopathy".

The value of routine endoscopic biopsies in the diagnosis of the vascular dilatation of PHG is less certain due to the comparatively small and superficial biopsies (13). Although Saperas et al. have found a snare biopsy technique to be adequate for obtaining good specimens in PHT (14). Such a procedure couldn't be recommended for routine use (2). We used standard biopsy forceps and capillary dilatation was showed in 81% of biopsy specimens. Although the endoscopic appearances of PHG were usually more noticeable in the fundus of the stomach, we should be take antral biopsy specimens to avoid inadvertent biopsy of gastric varices and also to maximize the detection of HP colonization (6).

In our study, prevalence of HP was quite similar in patients with mild and moderate PHG and without PHG, but was higher in patients with severe PHG than without PHG. It was probably due to less number of patients. D'Amico et al. reported that the prevalence of HP was low in severe PHG and insisted probably on the reduction of the mucus layer due to the marked gland atrophy. The role of HP in the gastric mucosa in PHT has still to be fully evaluated but evidence to date doesn't suggest that it plays a major pathogenetic role (6,15).

CONCLUSION

Endoscopic appearances of gastric mucosa in PHT is due to mucosal congestion. PHG is a different entity from inflammatory gastritis. There is no relation between mucosal congestion and inflammatory changes. Mucosal congestion is necessary but not sole. Other factors may play a role in the pathogenesis of gastric injury but colonization with HP is unlikely to be one of these.

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