Changing Prevalence of Gastric Fundic Gland Polyps: Current Scenario in North India

Zeeshan A Wani[1], M Muzzafer Mir[2], Akhter A Raina[3], Shaheen Nazir lone[4], Ursilla M Taranum[5]

ABSTRACT

Introduction: The prevalence and histopathological type of gastric polyp vary between populations. In the recent past aggressive treatment of *Helicobacter pylori* (*H. pylori*) and the excessive use of proton pump inhibitors (PPIs) have altered the prevalence of specific types of gastric polyp. This study was designed to evaluate the prevalence and histopathology background of gastric mucosa in cases with fundic gland polyps (FGP).

Material and Methods: The medical record of patients who underwent esophagogastroduodenoscopy in 2 centers in Northern India from 2011-2018 were reviewed.

Results: The prevalence of gastric polyps was 5%, of which 900 (50%) were fundic gland polyps (FGP). Mean age of presentation was 51.42 years, 70% were located in fundus/corpus, 62% had dyspepsia, chronic inactive gastritis (CIG) was present in 60%, 95% were multiple and 27% were more than 1cm in size.

Conclusions: As a result of anti - *H. pylori* treatment and the excessive use of PPIs, FGP are most common in Northern India. CIG, H. pylori gastritis and Intestinal metaplasia were seen in gastric histology of the cases. These results are interesting and provide new perspective to look for pathogenesis of gastric polyps.

Keywords Gastric Polyps, Prevalence, *Helicobacter pylori*, Fundic Gland Polyps, Fundus

INTRODUCTION

A gastrointestinal polyp is a discrete mass of tissue protruding into the lumen of the stomach. Benign gastric polyps are reported to be found in 3-5% of patients who undergo esophagogastroduodenoscopy (EGD).[1,2] The most common types of gastric polyp are the hyperplastic polyps (Hpp) and fundic gland polyps (FGP) with relative prevalences of 60% and 30% respectively, followed by adenomas with a prevalence of 10-15%. Other less common epithelial stomach proliferations represent the remainder of polyps. These figures are derived from previous studies conducted over long periods of time in relatively small numbers of patients (**Table 1**).[3-15]

Sporadic FGP are sessile polyps located usually in the fundus and corpus.[16] In general, their surface color is indistinguishable from that of normal gastric mucosa, and these lesions lack a stalk.[17] On microscopy, they contain dilated glands lined by gastric body mucosa, distorted glands and microcysts lined by parietal and chief cells; there is no or minimal inflammation.[18] Most endoscopists can diagnose these polyps on appearance alone with 89% accuracy[18]; the lesions appear as hyperemic, translucent, broad-based polyps with a smooth surface. The lesions vary in size from 1-8 mm and are most commonly found in middle-aged women[19], although much larger polyps are also seen in adult men and women of all age groups. An adenoma refers to dysplastic intestinal or gastric-type epithelium with variable architecture.[1]

In addition to histopathology of gastric polyps, histopathology of gastric mucosa in patients with gastric polyps has also been reported in the literature. Apart from *Helicobacter pylori* gastritis (HPG), chronic inactive gastropathy (CIG), reactive gastritis (RG) and intestinal metaplasia (IM) were also seen in patients with gastric polyps.[20] HPG, CIG, IM are well defined in the literature. RG is the second most common pathologic diagnosis after HPG.[21,22] RG refers to the chemical injury to the gastric mucosa leading to constellation of endoscopic and histologic findings.[23] The term "chemical gastropathy" was recommended by the updated Sydney System.[23] The common underlying causes of RG include chronic bile reflux and long-term intake of nonsteroidal anti-inflammatory drugs. Bile reflux usually occurs in patients who have undergone a Billroth II partial gastrectomy; it is also recognized to occur in intact stomachs in individuals with alcohol abuse, cigarette smoking, chronic respiratory disease, or duodenal ulcer, and even in healthy subjects.[24,25] The mucosal changes seen in RG are usually most prominent in the antrum and pre-pyloric region but the more proximal oxyntic mucosa may also be affected. The endoscopic findings of RG are mostly nonspecific. The mucosa may be normal or may exhibit erythema, congestion, edema or erosions.[24]

[1]Assistant Professor, Department of Gastroenterology and Hepatology, Government Medical College, Srinagar, Jammu Kashmir, [2]DNB Scholar, Department of Gastroenterology and Hepatology, Government Medical College, Srinagar, Jammu Kashmir, [3]Consultant, Department of Internal, Department of Medicine, Directorate of Health Services, Srinagar, Jammu Kashmir, [4]Senior Resident Gastroenterology, Consultant, Department of Internal Medicine, Directorate of Health Services, Srinagar, Jammu Kashmir, [5]Consultant, Directorate Health Services, Srinagar; Jammu Kashmir, India.

Corresponding author: Mohamad Muzzafer Mir, DNB Scholar, Department of Gastroenterology and Hepatology, Government Medical College, Srinagar, Jammu Kashmir, India

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RG is characterized by prominent foveolar hyperplasia with elongation and tortuosity of the gastric pits that gives these structures a corkscrew appearance. The surface may appear villiform. The foveolar cells show regenerative changes with mucin depletion, nuclear hyperchromasia, and increased mitoses. Special stains for *Helicobacter pylori* (*H. pylori)* are negative. The microscopic features of RG were well characterized by Dixon *et al* in their original description of reflux gastritis as a distinct histopathologic entity.[26] Foveolar hyperplasia, smooth muscle fibers, vasodilatation and congestion are key histologic parameters for the diagnosis of RG.[27]

In the west and in the United States in particular, data on gastric polyps have not been reevaluated on a large scale for 2 decades while several circumstances such as the treatment of *H. pylori* and the use of proton pump inhibitors (PPIs) have altered their relative and absolute frequency. In 2009, it was shown that relative prevalence of FGP was much higher than reported earlier, and was as high as 77% in contrast to previous studies showing 30%.[20] Whether this changing trend holds true in Asia and India has not been studied in large population in recent years.

This study was designed to investigate current trends in the prevalence of FGP in the Asian population especially in Northern India. In addition the relationship with chronic gastritis was also evaluated in the cases.

MATERIAL AND METHODS

This was an observational retrospective study. Medical records of patients who underwent EGD in 2 gastroenterology departments of Northern India between 2011 and 2018 were reviewed. Biopsy specimens of patients with gastric polyps were also reviewed. It is a usual practice in these 2 centers to take gastric biopsies as per updated Sydney protocol while removing or biopsing a gastric polyp. The policy for the evaluation of gastric biopsies in these centers is to specifically mention the presence or absence of *H. pylori* in the diagnostic report. When the *H. pylori* organism was not identified on hematoxylin and eosin stain, detection was aided by modified Giemsa stain. When staining results were negative but infection is nevertheless suspected on the basis of a histological finding of chronic active gastritis and lymphoid aggregates, a peroxidase conjugated monoclonal anti *H. pylori* immunostaining was carried out. Patients whose gastric biopsies were not assessed and properly graded as per the updated Sydney protocol were excluded from the study.

STATISTICAL ANALYSIS

Statistical analysis was conducted using SPSS ver. 16.0 for Windows (SPSS, Chicago, IL). Categorical variables were compared using the chi-square or Fisher's exact test where appropriate. Continuous data were compared using the t-test or the Mann-Whitney test, the Kruskal-Wallis test was used for multiple comparisons, when appropriate. Quantitative variables with a normal distribution were expressed as mean values ± standard deviation and those with a non-normal distribution as median values (range). Significance level was two-sided and set to less than 0.05.–Study was done after proper approval from institutional review board.

Informed consent was taken from all patients as part of endoscopic procedures. Identity of patients has not been disclosed while presenting this data. There were no financial affiliations regarding this study.

RESULTS

In this study 2250 polyps were seen on EGD, out of whom 450 patients were excluded for the following reasons:

A. Non-availability of concomitant gastric biopsies in 150 patients.

B. Incomplete polyp pathology and assessment of chronic gastritis as per updated Sydney protocol in 300 patients.

Of the 1800 patients with polyps, relative prevalence of FGP was 900 (50%). In the cases with FGP synchronous polyp were seen in 7 cases; Hpp in 4, adenomatous polyps 2 and xanthomas in one case. Mean age of presentations was 51.42 years with minimum of 13 years and maximum of 89 years,

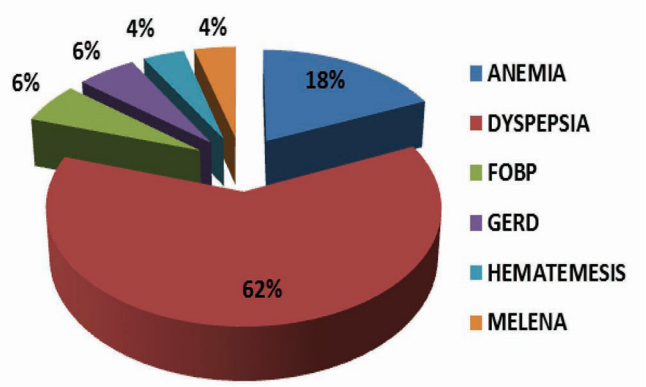

Figure-1: Presentation of cases (FOBP, fecal occult blood positive; GERD, gastroesophageal reflux disease)

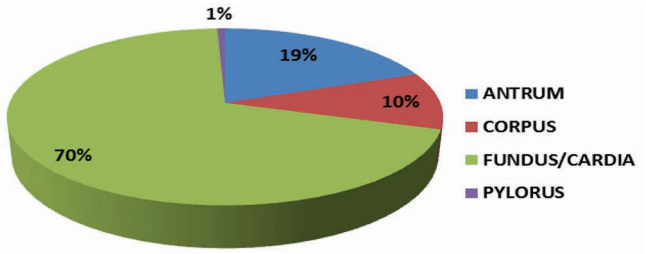

Figure-2: Location of FGP

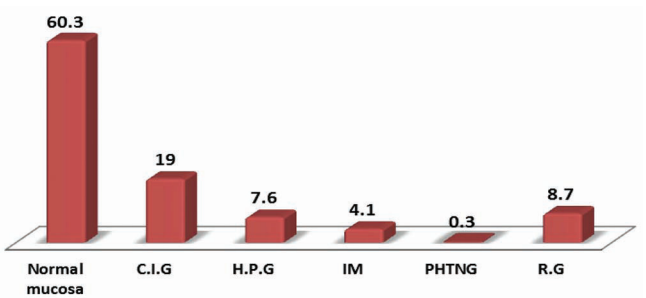

Figure-3: Gastric histology in cases (%) (HPG, Helicobacter pylori gastritis; CIG, chronic inactive gastropathy; RG, reactive gastritis; IM, intestinal metaplasia; PHTG, portal hypertensive gastropathy)

Author	Country	Pub. year	Years	No. of polyps	Hpp	FGP	Adenoma	Carcinoma	Inflammatory
Morais *et al*[8]	Brazil	2007	5	153	71.30%	16.30%	12.40%	2%	NR
Gencosmanoglu *et al*[6]	Turkey	2003	5	150	64%	14%	3%	NR	2%
Ljublcic[7]	Croatia	2002	1	42	50%	7%	17%	NR	NR
Sivelli[14]	Italy	2002	6	164	44.50%	NR	16.40%	0.60%	4.9%
Attard[5]	USA	2002	18	41	42%	40%	5%	NR	NR
Papa[10]	Italy	1998	7	121	55.4%	3.3%	9.90%	0.8%	28.9%
Archimandritis *et al*[4]	Greece	1996	4	258	75.6%	NR	6.60%	NR	17.8%
Stolte *et al*[13]	Germany	1994	20	5515	28.3%	47%	9%	7.20%	3.1%
Rattan *et al*[11]	Israel	1993	8	188	45.2%	NR	3.2%	5.3%	29.3%
Roseau *et al*[12]	France	1990	4	191	25.1%	9.9%	3.1%	NR	61.8%
Deppisch *et al*[15]	USA	1989	10	121	75%	17%	8.60%	NR	NR
Niv *et al*[9]	Israel	1985	8	99	23.2%	17.2%	10.1%	NR	25.3%
Laxen *et al*[3]	Finland	1982	10	357	55%	NR	8%	NR	36%

Hpp, hyperplastic polyps

Table-1: Data from previous studies regarding prevalence of different types of gastric polyps around the world[20]

Location of FGP	Frequency	Percent
Antrum	174	19.3
Corpus	94	10.4
Fundus/cardia	626	69.6
Pylorus	6	.7
Total	900	100.0

Table-2: Location of FGP

of whom 579 (64.30%) were male and 321 (35.70%) female. Mean weight of patients was 68.66 kgs with minimum 28 kgs and maximum of 98 kgs, standard deviation of 13.194. Out of 900 FGP cases, 250 (27.80%) were smokers. Multiple FGP were seen in 95% of cases.

The most frequent presenting complaint of patients with FGP cases was dyspepsia followed by anemia and others as given in Figure 1. The distribution of FGP in the stomach is in Figure 2/Table 2. FGP were most common in the fundus/cardia.

Background gastric histopathology in the cases is presented in Figure 3. Normal gastric histology was seen in 543, CIG in 171, HPG in 68, IM in 37, PHTNG in 3 and RG in 78 cases.

DISCUSSION

There is a changing trend in the relative prevalence of types of gastric polyps throughout the world. The relative prevalence of FGP even in a Northern Indian population was much higher than that reported in the earlier literature. In a large retrospective evaluation of gastric polyps from 5515 patients over a 20-year period, reviewed by Stolte et al in 1994[13], the incidence of FGP was 47%. In contrast, in 1996, Archimandritis from Greece[4] reported that the majority of polyps (75%) were Hpp. In a study from Brazil by Morais DJ et al in 2007[8], 70% of gastric polyps were Hpp and 16% were FGP. Deppisch et al[15] in 1998 reported a Hpp prevalence of 75% from the USA. In 2009, Carmack et al[20] reported a change in the trend for gastric polyp prevalence in a large series from the United States. In that series the relative prevalence of FGP was 77% in their population. In western countries the most commonly encountered polyps are FGP because of aggressive anti H. pylori treatment and because PPIs use is common.[28-30] The frequency of the most common type of polyp varies widely depending upon the population studied as Hpp and adenomatous polyps are relatively more frequent than FGP in regions with H. pylori infection.[21,30-33] Our population frequently uses PPIs and with the aggressive awareness regarding H. pylori treatment in the last 15 years we also expected a change in the prevalence of different types of polyp. In our study gastric polyps were seen in 1800 patients, FGP were 50%. Our data differ significantly from those reported earlier from the United States and other countries as shown in Table 1, the most remarkable discrepancy being in the relative prevalence of FGP. In 1989 they represented 17% of all gastric polyps in United States[15], and 10% in France[12], whereas during the years 2001-2006 they accounted for 16.3% of all polyps reported in a large Brazilian series.[8] The highest relative prevalence in the literature is 47% reported in a 20-year German study[13] In our series FGP made up 50% as mentioned above. These polyps were considered to be hamartomata in the past; they tend to arise in patients with H. pylori free stomachs who receive chronic PPIs treatment.[34-36] In our study only 7.6% have HPG. Given the widespread use of PPIs in Northern India especially in Jammu Kashmir because of the typical spicy dietary habits and the on counter use and free availability of PPIs even in remote areas of the state combined with better gastroenterological care to get these polyps biopsied, we also expected an increased prevalence of FGP. In our study we selected patients with polyps who had a concomitant gastric biopsy in accordance with the updated Sydney protocol to identify the associated type of chronic gastritis. We have observed continuing decline in H. pylori infection as well as the simultaneous increase in FGP. In addition, most of the polyps were FGP which was to be expected in patients who make extensive use of PPIs and probably undergo more H. pylori eradication. In the cases, 19 % of patients had CIG. It could be suggested that some forms of gastritis may increase the risk of gastric polyp; however, this needs further studies

for validation. The explanation for FGP being common polyps may be the changing trend in PPIs use and aggressive H. pylori treatment[28,29,37,38]; there has been a change in the spectrum of gastric polyps with the frequency of FGP increasing from 19% (15/80) to 77% (638/828) while Hpp decreased from 65% (52/80) to 15% (123/828).[38] However, our study may be biased by the inclusion of more patients with dyspepsia and excessive PPIs use in the cases as clinical details regarding the use of PPIs or anti-H.pylori treatment were not available.

CONCLUSION

In conclusion, our study is the first to describe the changing relative prevalence of different gastric polyps in a Northern Indian population as in west. There is rising trend of FGP possibly signifying increasing PPI use and *H. pylori* eradication therapy. Our study also highlights the specific types of chronic gastritis in cases. CIG, HPG and IM were more frequent in the cases. These results are interesting and provide new perspective to look into pathogenesis of gastric polyps.

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