

# Spectrum of Histopathological Lesions in patients undergoing Gastroduodenal Biopsies in a Tertiary Care Centre in North Karnataka, India

MADHURI RAO<sup>1</sup>, C BHARATH<sup>2</sup>

## ABSTRACT

**Introduction:** Patients with Gastrointestinal (GI) symptoms usually present with alarming symptoms. The use of modern flexible gastroduodenoscope and the acquisition of the mucosal biopsy specimens have opened a window to the living tissues and have greatly improved the diagnostic facility for the GI lesions. It provides an in depth visual assessment of GI mucosa and allows sampling of tissue to the pathologist for further assessment.

**Aim:** The aim of this study was to evaluate the spectrum of histopathological incidence of neoplastic and non-neoplastic lesions in patients undergoing gastroduodenal biopsy.

**Materials and Methods:** This was a prospective study of 100 patients conducted over a period of one year and seven months, December 2010 to June 2012 with symptoms of gastroduodenal diseases who attended endoscopic unit of the tertiary care hospital in Bellary North Karnataka, South India. All biopsies done for various upper abdominal symptoms like pain abdomen, dyspepsia, haematemesis, mass per abdomen, and vomiting were included. Routine haematoxylin and eosin,

special stains like Periodic Acid-Schiff (PAS) and Giemsa were done. Histopathological parameters evaluated included mucosa evaluation (ulceration, metaplasia, dysplasia, atrophy), type of inflammatory infiltrate, *H.pylori* infection and type of tumour. Data was analysed using descriptive analysis.

**Results:** Among 100 patients, 76 were males and 24 were females. Highest percentage of study participants were in the age group of more than 58 years 30 (30%). The most common endoscopic presentation was gastric erythema in 42 (42%) cases followed by benign gastric ulcer 16 (16%) cases, ulcero proliferative growth 15 cases, and duodenal erythema 13 (13%) cases. The most common histopathological diagnosis amongst non-neoplastic lesions were chronic gastritis 44 (44%) cases chronic duodenitis 15 cases, and benign gastric ulcer 11 (11%) cases and amongst neoplastic lesions, most common was gastric adenocarcinoma 15 (15%) cases.

**Conclusion:** Endoscopy gross findings are not disease specific hence, histopathological study of biopsy specimen can help in confirmation of the diagnosis.

**Keywords:** Gastric adenocarcinoma, Gastroduodenoscope, Gastric erythema, Neoplasia

## INTRODUCTION

The use of modern flexible gastroduodenoscope and the acquisition of the mucosal biopsy specimens have opened a window to the living tissues and have greatly improved the diagnostic facility for the GI lesions. It provides an in depth visual assessment of GI mucosa and allows sampling of tissue to the pathologist for further assessment [1,2].

Endoscopic biopsies are helpful in disease diagnosis, disease process monitoring, early assessment of complications as well as early assessment of treatment response. In the adult population, gastroduodenal diseases are commonest with stomach and duodenum disorders being a cause for frequent clinical visit. Clinical symptoms vary from dysphagia to dyspepsia to altered bowel movements, which pathologically could vary between the common non-neoplastic and neoplastic lesions. Dyspeptic symptoms, secondary to *H.pylori* infection can lead to debilitating consequences, particularly increasing the risk of adenocarcinoma [3-6].

Clinically and endoscopically, disease state can be identified, however, biopsy is necessary for confirmation, to provide an exact diagnosis for further management. Endoscopic biopsy, apart from being diagnostic, also plays a major role in monitoring the course, extent and the response to therapy [1,2,5,6].

The aim of this study was to evaluate the demographical spectrum of incidence of histopathological lesions both neoplastic and non-neoplastic undergoing gastroduodenal biopsy. The primary objective of the study was to study the overall frequency, age and sex distribution of various lesions. The secondary objective included

studying spectrum of histopathological lesions, both non-neoplastic and neoplastic in patients undergoing gastroduodenal biopsy.

## MATERIALS AND METHODS

This was a prospective cross-sectional study of 100 patients with symptoms of gastroduodenal diseases who attended endoscopic unit of a tertiary care hospital in Bellary, Karnataka, South India for a period of one year and six months December 2010 to June 2012. Permission for the Ethical committee clearance was not obtained as it did not involve any interaction with human subjects. All biopsies done for various upper abdominal symptoms with or without systemic symptoms such as pain abdomen, dyspepsia, haematemesis, mass per abdomen, and vomiting were included in the study. Endoscopy done for therapeutic purposes or cases, where biopsies could not be done was excluded from the study. In this study, all the 100 patients during the study period with various gastroduodenal symptoms were subjected to upper GI endoscopic examination and biopsy.

Out of 100 gastroduodenal biopsies, 81 were gastric biopsies and 19 were duodenal biopsies.

Olympus G/F-Q Panendoscope was used for the present study. Once the biopsy was collected, the biopsy tissue was placed on the filter paper and was transferred into the bottle containing 10% neutral formalin. After fixation of the biopsy specimen, it was wrapped in a piece of filter paper and processed in a perforated capsule. Routine haematoxylin and eosin, special stains like PAS, Giemsa were done, and histological diagnosis made. Histopathological parameters evaluated included mucosa evaluation (ulceration, metaplasia,

dysplasia, atrophy), type of inflammatory infiltrate, H.pylori infection and type of tumour.

## STATISTICAL ANALYSIS

Data was analysed using descriptive analysis.

## RESULTS

Among total study participants, 76 (76%) were males and 24 (24%) were females. Highest percentage of study participants was in the age group of more than 58 years 30 (30%) [Table/Fig-1]. Majority of patients presented with pain abdomen 71 (71%) followed by dyspepsia (34%). Among the commonest site involved in gastroduodenal diseases, the commonest one was pylorus 37 (37%) [Table/Fig-2]. A 60 (60%) of them were smokers and 62% of them were alcoholics. The most common endoscopic presentation was gastric erythema 42 (42%) followed by benign gastric ulcer 16 (16%), ulcero-proliferative growth 15 (15%), duodenal erythema 13 (13%), erosions, malignant gastric ulcer, erosions and infiltrative growth 3 (3%) each, GJ stomal ulcer and antral polyp 1 (1%) each.

Age group	Sex		Total
	Males	Females	
18-28 years	5 (6.6%)	2 (8.3%)	7 (7%)
29-38 years	12 (15.8%)	9 (37.5%)	21 (21%)
39-48 years	20 (26.3%)	3 (12.5%)	23 (23%)
49-58 years	14 (18.4%)	5 (20.8%)	19 (19%)
>58 years	25 (32.9%)	5 (20.8%)	30 (30%)
Total	76 (100%)	24 (100%)	100 (100%)

[Table/Fig-1]: Age group distribution data of present study.

Site	Number
Pylorus	37
Body	19
Antrum	17
Duodenum	17
Fundus	5
Cardia	3
GJ stoma	1
Ampulla	1
Total	100

[Table/Fig-2]: Distribution of study subjects based on site.

The most common histopathological diagnosis amongst nonneoplastic lesions was chronic gastritis 44 (44%) followed by benign gastric ulcer 11 (11%) [Table/Fig-3-5]. Amongst neoplastic lesions, it was gastric adenocarcinoma 15 (15%) [Table/Fig-6]. Location wise, the most common lesion were in pylorus, body and antrum in the stomach [Table/Fig-7]. In the duodenum, the most common lesion amongst non-neoplastic lesions was chronic duodenitis 14 (14%), followed by duodenal ulcer 2 (2%) and amongst neoplastic lesions, it was adenocarcinoma 1 (1%).

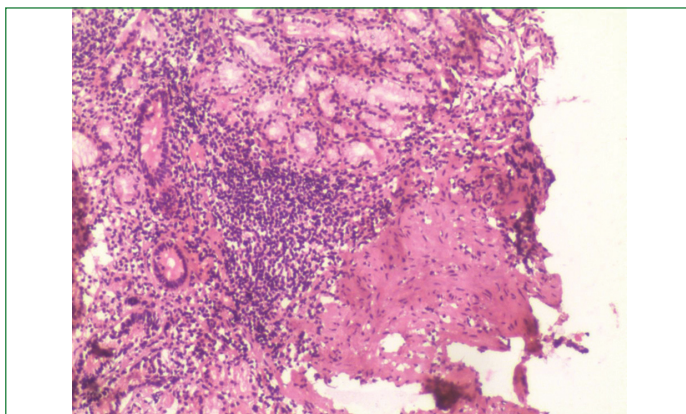
The most common site for chronic gastritis was pylorus (47.7%) followed by body (29.5%), antrum and cardiac [Table/Fig-7]. The incidence of chronic gastritis and gastric carcinoma were found to be more common in men (67% and 73%, respectively). Out of 44 cases of chronic gastritis, *H.pylori* positive cases prevalence was 15 (34.09%) cases [Table/Fig-8]. Highest percentage of cases having gastric adenocarcinoma was noted in the 6<sup>th</sup> decade. The most common type of gastric adenocarcinoma was intestinal type (80%) followed by diffuse type (20%).

## DISCUSSION

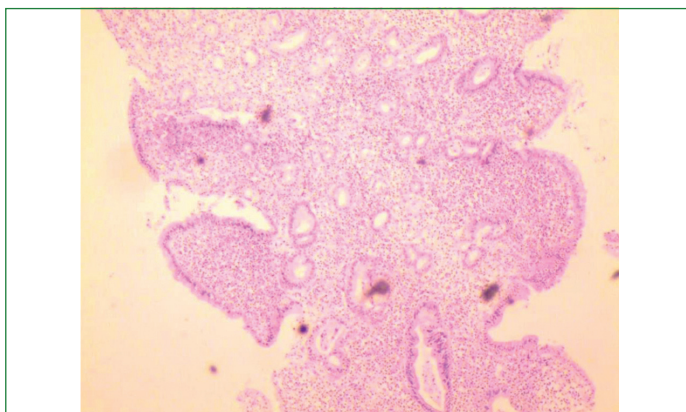
Sampling of the gastrointestinal mucosa through endoscopic biopsy helps in diagnosis of various lesions at an early stage. Gastro-

Histopathological diagnosis	Number
<b>Non-neoplastic</b>	
Chronic gastritis	44
Inflammatory antral polyp	1
Chronic duodenitis	15
Benign gastric ulcer	11
Gastric dysplasia	3
Duodenal ulcer	2
Inadequate	2
<b>Neoplastic</b>	
Gastric adenocarcinoma	15
Duodenal adenocarcinoma	1
Ampullary adenocarcinoma	1
Normal	5
Total	100

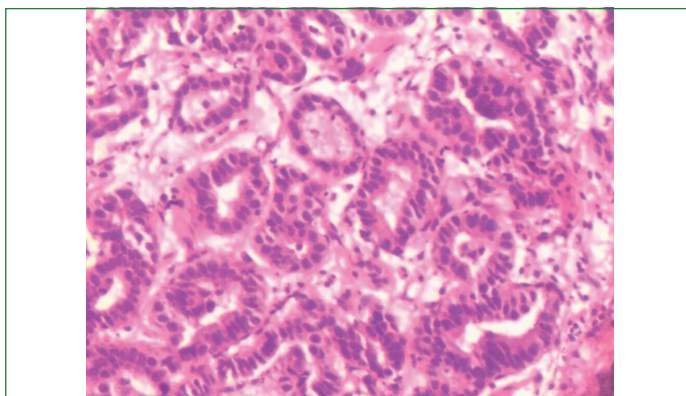
[Table/Fig-3]: Distribution of study subjects based on histopathological diagnosis.



[Table/Fig-4]: Chronic gastritis showing mucosal ulceration with chronic plasmalymphocytic inflammatory infiltrate pylorus (10x: H&E).



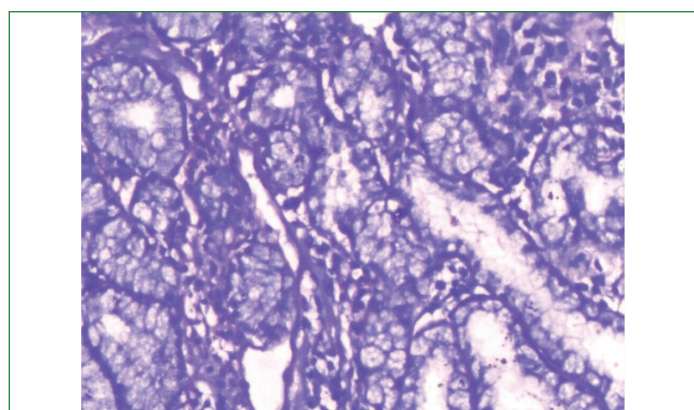
[Table/Fig-5]: Section studies shows thinning of the mucosa with dense plasma lymphocytic infiltration of the lamina propria-Chronic atrophic gastritis (10x: H&E).



[Table/Fig-6]: Well-differentiated gastric adenocarcinoma intestinal type (45x: H&E).

Site	Histopathological diagnosis	Number
Cardia	Chronic gastritis	3
Fundus	Adenocarcinoma	1
	Benign gastric ulcer	1
	Chronic gastritis	1
Body	Chronic gastritis	13
	Benign gastric ulcer	4
	Gastric erosion	1
Antrum	Chronic gastritis	6
	Adenocarcinoma	4
	Gastric dysplasia	3
	Benign gastric ulcer	2
	Inflammatory polyp	1
Pylorus	Chronic gastritis	21
	Adenocarcinoma	10
	Benign gastric ulcer	2
Gastrojejunal stoma	Chronic stomal ulcer	1
Ampulla	Adenocarcinoma	1
Duodenum	Adenocarcinoma	1
	Duodenal ulcer	2
	Chronic duodenitis	15

**[Table/Fig-7]:** Distribution of lesions (histopathological diagnosis) with respect to site in the stomach and duodenum.



**[Table/Fig-8]:** Spiral shaped *Helicobacter pylori* in the gastric pits (10x: Giemsa stain).

intestinal biopsy is usually indicated in diagnosis with gastritis with H.pylori status, duodenitis or to differentiate between benign and malignant tumours. Histopathological study helps in confirmation of a benign/inflammatory or malignant condition, allowing for an early management without unnecessary delay. Endoscopy is known to be less discomfoting, and well tolerated, with a direct visual of lesion [2,4,7].

In the present study, the number of males undergoing upper GI endoscopy was more than the number of females. Similar findings were found in the previous studies as shown in [Table/Fig-9] [8-15]. In all these studies, males outnumbered females, possibly due to increased prevalence of smoking, stressful life, and alcoholism. In our study, the primary habitual factors in patients of gastroduodenal symptoms undergoing endoscopy were smoking and alcoholism, similar to study done by Hirota WK [16].

Majority patients in the present study were more than 58 years of age, similar to the study done by Froehlich F et al., [15]. Next highest age group prevalence was noted in fourth decade similar to study done by Modi D et al., and Froehlich F et al., which showed similar findings. Also, similarly, both studies showed least number of cases in the third decade, similar to our study [5,15].

The most common histological pattern noted in gastric biopsies was chronic gastritis followed by gastric adenocarcinoma, which is similar to other studies as shown followed by gastric adenocarcinoma

Study	Place of study	Total no. of patients	Males	Females	Ratio (M:F)
Siddiqui B et al., (2020) [8]	Aligarh, India	556	333	223	1.49:1
Hirachand S et al., (2018) [9]	Kathmandu, Nepal	243	138	105	1.76:1
Bhat N et al., (2018) [10]	Srinagar, India	200	120	80	1.5:1
Jestadi A et al., (2016) [11]	Hyderabad, India	87	62	25	2.47: 1
Sharma P et al., (2015) [12]	Jammu, India	100	65	35	1.86:1
Islam SM et al., (2014) [13]	Bangladesh	110	58	52	1.12:1
Lieberman DA (2000) [14]	United States	100	57	43	3.8:2.86
Froehlich F et al., (1997) [15]	Switzerland	139	77	62	5.13:4.13
Present study (2023)	Bellary, India	100	76	24	3:1

**[Table/Fig-9]:** Comparative study based on male female ratio [8-15].

[Table/Fig-10] [5,6,8-12,17]. In the duodenum, Hirachand S et al., did not find any malignancy, while we reported two cases in our study [9].

Study	Place of study	Total no. of cases	Neoplastic lesions	Non-neoplastic lesions
Thapa R et al., [6] (2013)	Kathmandu, Nepal	80	Gastric adenocarcinoma-18 (22%)	Chronic gastritis-44 (55%)
Sharma P et al., (2015) [12]	Jammu, India	100	Gastric carcinoma-5 (5%)	Chronic gastritis-64 (64%)
Jeshadi A et al., (2016) [11]	Hyderabad, India	87	Gastric carcinoma-41 (47.12%)	H pylori induced gastritis-21 (24.13%)
Hirachand S et al., (2018) [9]	Kathmandu, Nepal	243	Gastric adenocarcinoma-27 (11%)	Chronic gastritis-173 (71%)
Bhat N et al., (2018) [10]	Srinagar, India	110	Gastric adenocarcinoma-28 (25.45%)	Chronic active gastritis with H pylori-26 (23.63%)
Venkatesh V et al., [17] (2019)	Coimbatore, India	180	Gastric adenocarcinoma-11 (6%)	Chronic gastritis-84 (47%)
Siddiqui B et al., (2020) [8]	Aligarh, India	556	Gastric adenocarcinoma-5 (89%)	Non specific inflammation-117 (21.04%)
Modi D et al., [5] (2022)	Palanpur, India	72	Maltoma-8 (11%)	Chronic gastritis-32 (44%)
Present study (2023)	Bellary, India	100	Gastric adenocarcinoma-15 (15%)	Chronic gastritis-44 (44%)

**[Table/Fig-10]:** Common gastro duodenal neoplastic and non-neoplastic lesions comparison [5,6,8-12,17].

The incidence of H.pylori in chronic gastritis was noted in 34.09% cases, which is less than that noticed in other studies [Table/Fig-11] [12,17-20]. Gastric carcinomas were more common in males than

Study	Place of study	H.pylori prevalence
Malaoa SZ (2021) [18]	South Africa	54.5%
Khoder G et al., (2019) [19]	UAE	41%
Venkatesh V et al., [17] (2019)	Coimbatore, India	22%
Sharma P et al., (2015) [12]	Jammu, India	50.56%
Godhkindi VM et al., (2012) [20]	Nanded, India	60.9%
Present study (2023)	Bellary, India	34.09%

**[Table/Fig-11]:** Comparison of Incidence of H.pylori in chronic gastritis [12,17-20].

females (2.8:1) in the present study and this correlates with the study done by David A with male:female ratio of 2.5:1 [14]. Studies by Thapa R et al., and Hirachand S et al., have also noted higher incidence of adenocarcinoma variant of gastric cancer (90-95%), which is similar to our study that adenocarcinoma account for 90-95% of gastric cancer [6,9].

### Limitation(s)

The main limitation of the study was the small sample size. Additional Immunohistochemical (IHC) and molecular studies, could have added more to the existing literature.

### CONCLUSION(S)

Endoscopic biopsy helps in early diagnosis and management. Endoscopy biopsy is particularly indicated in patients with gastroduodenal symptoms beyond the fourth decade to evaluate neoplastic lesions. It was therefore concluded that the gross findings on endoscopy are not disease specific and may be seen in various other upper GI pathologies. Histopathological study of biopsy specimen will confirm endoscopic diagnosis in most of the cases.

### REFERENCES

- [1] Brandt LJ. Clinical practice of gastroenterology- Stomach and Duodenum, Churchill Livingstone, 1999;1:151-415.
- [2] Teriaky A, AlNasser A, McLean C, Gregor J, Yan B. The utility of endoscopic biopsies in patients with normal upper endoscopy. *Can J Gastroenterol Hepatol.* 2016;2016:3026563. Doi: 10.1155/2016/3026563. Epub 2016 Jul 10. PMID: 27478819; PMCID: PMC4958432.
- [3] Aruna E, Kalyan Chakravarthy V. Prospective study on histopathological spectrum of upper gastrointestinal tract lesions in a teaching hospital of southern India. *Journal of Clinical & Diagnostic Research.* 2020;14(11):EC37-EC41.
- [4] Ghosn Y, Hussein Kamareddine M, Tawk A, Bou-Ayash N, Bou-Ayash H, Mokamer N, et al. Analysis of gastric and duodenal biopsy results in patients presenting with dyspepsia: a cross-sectional study in a middle-eastern population. *BMJ Open Gastroenterol.* 2019;6(1):e000330. Doi: 10.1136/bmjgast-2019-000330. PMID: 31645989; PMCID: PMC6781958.
- [5] Modi D, Patel S, Modi J. Assessment of histopathological spectrum of various gastroduodenal lesions. *European Journal of Molecular & Clinical Medicine.* 2022; 9(3): 1648-53.
- [6] Thapa R, Lakhey M, Yadav PK, Kandel P, Aryal C, Subba K. Histopathological study of endoscopic biopsies. *Journal of Nepal Medical Association.* 2013;52(190):354-56.
- [7] Shepherd NA, Valori RM. The effective use of gastrointestinal histopathology: guidance for endoscopic biopsy in the gastrointestinal tract. *Frontline Gastroenterol.* 2014;5(2):84-87. Doi: 10.1136/flgastro-2013-100413. Epub 2014 Jan 8. PMID: 28840920; PMCID: PMC5369724.
- [8] Siddiqui B, Faridi SH, Shehwar D, Ahmed S, Mazumder MA. A study of age-wise spectrum of gastrointestinal biopsies with endoscopic correlation a 5-year experience from a tertiary health care centre in north India. *Int J Pathol Clin Res.* 2020;6:113.
- [9] Hirachand S, Sthapit RR, Gurung P, Pradhanang S, Thapa R, Sedhai M, et al. Histopathological spectrum of upper gastrointestinal endoscopic biopsies. *Journal of BP Koirala Institute of Health Sciences.* 2018;1(1):67-74.
- [10] Bhat N, Sheikh BA, Mir JN, Reshi R, Wani LA, Farooq S. Histopathological Study of Upper Gastrointestinal Endoscopic Biopsies-1 Year Prospective Study. *Br Biomed Bull.* 2018;6(2):315.
- [11] Jeshtadi A, Mohammad AM, Kadaru MR, Nagamuthu EA, Kalangi H, Boddu A, et al. Study of gastric biopsies with clinicopathological correlation- A tertiary care centre experience. *J Evid Based Med Healthc.* 2016;3(57):2937-40.
- [12] Sharma P, Kaul KK, Mahajan M, Gupta P. Histopathological spectrum of various gastroduodenal lesions in North India and prevalence of Helicobacter pylori infection in these lesions: a prospective study. *International Journal of Research in Medical Sciences.* 2017;3(5):1236-41.
- [13] Islam SM, Ahmed AM, Ahmad MS, Hafiz SA. Endoscopic and histologic diagnosis of upper gastrointestinal lesions, experience in a port city of Bangladesh. *Chattagram Maa-O-Shishu Hospital Medical College Journal.* 2014;13(3):11-14.
- [14] Liberman DA patterns of endoscopy use in the United States. *J Gastroenterol.* 2000;118(3):619-24.
- [15] Froehlich F, Pache I, Burnand B, Vader JP, Fried M, Kosecöff J, et al. Underutilization of upper gastrointestinal endoscopy. *Gastroenterology.* 1997;112(3):690-97.
- [16] Hirota WK. Specialized intestinal metaplasia dysplasia and cancer of the esophagogastric junction and stomach: Prevalence and clinical data *J Gastroenterol.* 1999;116(2):277-85.
- [17] Venkatesh V, Thaj RR. Histopathological spectrum of lesions in gastrointestinal endoscopic biopsies: A retrospective study in a tertiary care center [Internet]. *World Journal of Pathology.* 2019 [cited 2022 Dec 9]. Available from: <http://www.npplweb.com/wjp/fulltext/8/1>
- [18] Molaoa SZ. Prevalence of Helicobacter pylori infection and the incidence of the associated malignant and peptic ulcer disease (PUD) at Nelson Mandela Academic Hospital: a retrospective analysis. *J Drug Assess.* 2021;10(1):57-61. Doi: 10.1080/21556660.2020.1854560. PMID: 34104536; PMCID: PMC8158191.
- [19] Khoder G, Muhammad JS, Mahmoud I, Soliman SSM, Buruoa C. Prevalence of Helicobacter pylori and its associated factors among healthy asymptomatic residents in the United Arab Emirates. *Pathogens.* 2019;8(2):44. Doi: 10.3390/pathogens8020044. PMID: 30939800; PMCID: PMC6632043.
- [20] Godkhindi VM, Meshram DP, Deshpande SA, Kadam PN, Chavan YH. The histopathological study of various gastro-duodenal lesions and their association with Helicobacter pylori infection. *IOSR J Dent Med Sci (IOSR-JDMS).* 2013;2(3):51-55.

#### PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Pathology, Sapthagiri Institute of Medical Sciences and Research Center, Bangalore, Karnataka, India.
2. Professor, Department of Pathology, Vijaynagar Institute of Medical Sciences, Bellary, Karnataka, India.

#### NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Madhuri Rao,  
No. 1586 17<sup>th</sup> A Main 1<sup>st</sup> Stage 5<sup>th</sup> Block HBR Layout Bangalore-560043,  
Karnataka, India.  
E-mail: dr.madhurirao@gmail.com

#### PLAGIARISM CHECKING METHODS: (Jain H et al.)

- Plagiarism X-checker: Sep 26, 2022
- Manual Googling: Nov 11, 2022
- iThenticate Software: Feb 04, 2023 (21%)

#### ETYMOLOGY: Author Origin

#### AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Sep 15, 2022**

Date of Peer Review: **Nov 17, 2022**

Date of Acceptance: **Mar 07, 2023**

Date of Publishing: **Apr 01, 2023**