IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 20, Issue 1 Ser.15 (January. 2021), PP 34-39
www.iosrjournals.org

Histopathological Spectrum of Small Intestinal Lesions a Tertiary Care Centre Experience

K.Sampurna[1] ,Syeda Sumaiaya Fatima[2] ,G.Sreelaxmi[3] ,Vanipadmaja[4]
1 Assistant Professor,Department of Pathology,Osmania Medical College,Hyderabad, Telangana ,India
2 Assistant Professor,Department of Pathology,Osmania Medical College,Hyderabad, Telangana ,India
3 Assistant Professor,Department of Pathology,Osmania Medical College,Hyderabad, Telangana ,India
4 Professor and HOD Department of Pathology,Osmania Medical College,Hyderabad, Telangana ,India
Coreesponding Author: Syeda Sumaiah Fatima

Abstract:
Background*: Small intestine accounts for majority of GIT and is affected by various diseases ranging from developmental abnormalities, infectious diseases to malignancies. The intestines are also the principal site where the immune system interfaces with a diverse spectrum of antigens present in food and gut m Ī icrobes and hence a site for wide range of inflammatory response. This study was carried out to study the occurrence and evaluate histopathology of small intestinal lesions and ileocaecal region lesions* **.**
Materials and Methods: *A retrospective study of small intestinal and ileocaecal region lesions,with specific emphasis on types of lesions in duodenum ,jejunum and ileum separately and in detail was carried out on 145 surgical specimens and biopsy received from Department of Surgery from January 2017 to December 2017. Specimens were preserved and fixed in 10% buffered formalin. Subsequently processing was done and slides stained with Haematoxylin and Eosin. Histopathological diagnosis was noted for each case. Categorical data was expressed in terms of rates, ratios and percentage.*
Results: *A total of 145 cases were included, among which 98 were males and 47 were females, with peak occurrence in 31-40 years age group. Pain abdomen was the commonest symptom. Histopathology spectrum studied in small intestinal lesions showed 124 cases (85.5%) were non-neoplastic, whereas 21 cases (14.5%) were neoplastic lesions. The most common non-neoplastic lesion seen was non specific inflammation of intestine. Other lesions seen were perforation, Ischemic enteritis with or without gangrene, tuberculosis etc. Neoplastic lesions included rare cases like GIST and Metastatis from lung and ovary. In duodenum non specific duodenitis was most common, in jejunum it was ischemic enteritis, while ileum showed highest and varied types of lesions from non specific lesions to metastasis.In ileocaecal region, non specific inflammation was common along with tuberculosis. Other lesions were Crohns disease, Meckle's diverticulum etc. Conclusion: There is wide spectrum of lesions seen in Small intestine and ileocaecal region. This study emphasises the need for early diagnosis of the disease through histopathology, which when correlated clinically will help the clinician to implement the appropriate treatment and improve the survival of the patients*
Keywords*: Small intestine ,Duodenum, Ileum, Jejunum, Tuberculosis, ,Carcinoma.*

Date of Submission: 13-01-2021 Date of Acceptance: 28-01-2021

I. Introduction

Small intestine is the principal site for digestion and absorption of ingested food from the gastro intestinal tract. Nearly 75% of the total length of the gastrointestinal tract is made up by small intestine and it constitutes more than 90% of the mucosal surface area. The intestines are also the principal site where the immune system interfaces with a diverse spectrum of antigens present in food and gut microbes [1]. The diseases of small intestine can be broadly classified as following: developmental abnormalities, muscular and mechanical disorders, inflammatory disorders, vascular disorders, epithelial tumours, nonepithelial tumours and tumour-like lesions [2]. The advent of ileoscopy helps to demonstrate various forms of enteritis [3]. Interruption or reduction of the small bowel blood supply results in changes, which vary in severity from superficial mucosal necrosis to irreparable full thickness damage with necrosis [4]. Worldwide, malignant tumours of the small intestine are less than 1.0 per 100,000 population and hence are rare [5]. Extensive study was done by Pan SY et al. [6] who reported 1,609 cases and another by Howe JR et al.,[7] who reviewed 4,995 patients with small bowel adenocarcinoma in the national cancer database. Nearly, two thirds of the small bowel tumours were malignant, with commonest being adenocarcinoma. The other types of tumours included carcinoids, sarcomas and lymphomas. In their study most tumours originated in duodenum (55.2%) which was followed by jejunum (17.6%) and the ileum (13%) [8]. Thus, the present study was conducted to evaluate the clinical spectrum and

various histological lesions of the small intestine separately in duodenum, jejunum and ileum. The objective of this study is to study the histomorphology of all the small intestinal lesions and ileocaecal region lesions and to determine the pattern of the lesions with respect to age, sex, anatomical site and frequency.

II. Material and Methods

This is a retrospective study done in Department of Pathology, Osmania Medical College, Hyderabad. A total of 802 cases of whole GIT were received between January to December 2017 from departments of Surgery and Surgical Gastroenterology of Osmania Hospital. Of which 145 were of small intestine and ileocaecal region The histopathological study of these 145 cases was carried out on surgical specimens and biopsies . Of the total 145 cases 50 were resection specimens and 95 were biopsies. History and details of all cases were noted. Lesions of the third part of duodenum, jejunum, ileum and ileocaecal junction were included. All samples of appendix and inadequate and poorly preserved biopsy specimen were excluded from the study. Gross examination was carried out to find out the size, shape and extent of lesions. Resected specimens and endoscopic biopsies of small intestine were preserved in 10% formalin and fixation done, processed for paraffin sectioning and stained by routine haematoxylin and eosin stains. Special stains like Zei lNeelson for AFB , PAS and IHC were done wherever required. All sections were examined and various histopathological diagnosis were noted. The data was analyzed and frequency, distribution and percentages were tabulated.

3.Results:

Of the total of 802 GIT cases ,145 were from small intestine There were 98 males and 47 females with a male to female ratio of 1.9:1. The most common site involved in small intestinal lesions (Total: 145 cases) was the ileum (53.3%), followed by duodenum (30.3%) and jejunum (6.8%). Maximum number of small intestinal lesions were seen in 31-40 years and the same trend was seen in lesions of ileocaecal region. The age wise distribution is shown in Table 1.

Table 1: Age wise distribution of different sites of small intestinal lesions:

Age in years	Duodenum	Jejunum	Ileum	Ileocaecal	Total
0-10	02	00	00	00	02
11-20	01	02	12	02	17
21-30	08	02	14	03	27
31-40	06	04	23	04	36
41-50	09	01	11	03	25
51-60	06	01	07	02	16
61-70	07	00	08	00	15
>70	05	00	02	00	07
Total	44	10	77	14	145

Highest number of lesions were seen in Ileum,next being duodenum,least being jejunum and most common age group that is effected is between41 to 50 years in duodenum,31 -40 in jejunum, ileum and ileocaecal regions.

Table 2 : Type of lesions in small intestine site wise

Site	Non neoplastic	Neoplastic Benign	Neoplastic Malignant	Total
Duodenum	30 (68.2%)	09 (20.5%)	05 (11.3%)	44 (30.4%)
Jejunum	08 (80%)	00 (00%)	02 (20%)	10 (6.9%)
Ileum	73 (94.8%)	02 (2.6%)	02 (2.6%)	77 (53%)
Ileocaecal	13 (92.8%)	00 (00%)	01 (7.2%)	14 (9.7%)
	124 (85.5%)	11 (7.6%)	10 (6.9%)	145 (100%)

The non neoplastic lesions are majority in all parts of small intestine accounting for 85.5% of cases,and benign lesions accounted to 7.6% and malignant lesions were 6.9% of all lesions.

Symptoms seen in all the lesions are shown in Table 3. Among the 145 cases, pain abdomen was the commonest symptom seen in 82% patients, followed by vomiting (50 %). The least common symptom was generalized weakness due to anemia seen in 4% of cases.

Table 3: Presenting symptoms in patients with small intestinal and ileocaecal lesions

symptoms	Number of cases	Percentage
Pain abdomen	119	82 %
vomiting	72	50 %
fever	30	21 %
Mass per abdomen	14	10 %
Weight loss	13	09 %
diarhoea	12	08 %
jaundice	07	05 %

anaemia	06	04 %

Histopathological spectrum studied in small intestinal lesions showed 124 cases (85.5%) as non-neoplastic and 21 cases (15.5%) as neoplastic lesions. The histopathological spectrum is as shown in following tables.

III. Histopathological spectrum of small intestinal lesions:

A very wide range of histopathological spectrum is observed in various sites of small intestine. Here an attempt is made to shoe the spectrum separately in duodenum,jejunum and ileum.

Table 4: Duodenal lesions

S.no	Type of lesions	Total number of cases	%
1	Non specific duodenitis	22	50 %
2	Nodular Duodenitis	04	9.1 %
3	Brunner gland hyperplasia	01	2.3 %
4	Duodenal ulcer with dysplasia	01	2.3 %
5	Celiac sprue	02	4.5%
6	Hyperplastic polyp	03	6.8%
7	Tubulovillous polyp	01	2.3 %
8	Inflammatory polyp	04	9.1 %
9	Mucosal polyp	01	2.3%
10	Adenocarcinoma	05	11.4%
	Total	44	100%++

Table 4 shows the various histopathological spectrum of lesions in duodenum. The nonneoplastic lesions accounted for majority of lesions . In benign cases different types of polyps were noted and 5 cases of duodenal Adenocarcinoma were also noted in Duodenum.

Table 5: Jejunal lesions

S. no.	Type of lesions	Total number of cases.	%
1	Non specific jejunitis	01	10 %
2	Acute ischemic enteritis	04	40 %
3	Non specific perforation	01	10 %
4	Caseating granulomatous inflammation of jejunum	01	10 %
5	Inflammatory bowel disease-Crohn's	01	10 %
6	GIST	01	10 %
7	Metastasis from lung	01	10 %
	Total	10	100%

Table 5 shows the different types of lesions in Jejunum. Apart from non specific jejunitis ,Jejunum showed rare tumors like Gastro intestinal Stromal Tumor for which IHC of CD117 was positive. and one interesting case of Metastasis from lung was also noted which was diagnosed after an extensive work up with IHC panel which showed CK 7&Vimentin diffuse positivity with focal Napsin granular cytoplasmic positivity with Ki-67 index of 67%.

Table 6: Ileal lesions

S.no	Type of lesions	Total cases	%
1	Chronic nonspecific enteritis	40	52 %
2	Acute ischemic enteritis	05	6.5 %
3	Acute necrotic iletis	01	1.3%
4	Perforation ileum	07	09 %
5	Caseating granulomatous ileitis	07	09%
6	Foreign body giant cell reaction to suture material	01	1.4%
7	IBD-Crohn's	05	6.5%
8	Gangrenous ileitis	03	3.9 %
9	Benign lymphoid hyperplasia	03	3.9%
10.	Meckel's diverticulum	01	1.3%
11	Adenomatous polyp	01	1.3%
12	GIST	01	1.3%
13	Granulocytic Sarcoma	01	1.3%
14	Metastasis from Papillary Serous Cystadeno carcinoma	01	1.3%
	Total	77	100%

Table 6 shows Ileal lesions which accounted for highest number of cases in this study, with majority of them being chronic duodenitis. Also cases of Caseating Granulomatous iletis, Crohn's disease ,GIST and one case of Metastasis from Papillary serous cystadenocarcinoma were noted.

Table 7: Ileocaecal Lesions

S. No	Type of lesions	No. of cases	%
1	Non specific inflammation	07	50 %
2	Granulomatous inflammation	03	21.4 %
3	IBD-Crohns	03	21.4%
4	Adenocarcinoma	01	7.14%
	Total	14	

Table 7 shows lesions in Ileocaecal region with majority of them being non specific inflammation, and others included Granulomatous lesions and inflammatory bowel disease-Crohn's and one case of Adenocarcinoma was also noted. .

IV. Discussion

In the present study, the highest number of cases were seen in 31-40 years age group which accounted for 36% of cases, whereas study conducted by Nanavati MG et al [9] showed highest number of cases in 21-30 years age group and study conducted by M.H. Prabhu Mural et al [19]showed highest number of cases in 60 to 70 years age group ,thus indicating that small intestinal lesions can occur at any age groups and probably varies in different geographical locations and in different environmental conditions. A male predominance was observed in present study with 67.5% being males and 32.5 % females with a male to female ratio of 1.9:1. The study conducted by Nanavati MG et al [9] found a male predominance with 63.5% and 36.5% being females and male to female ratio of 1.73:1 which was comparable to present study. Study conducted by Ansari HA et al, [10] showed a male predominance with 55.26% and 44.74% being females and male to female ratio of 1.24:1 which was again comparable to our study justifying males are more commonly affected than females. The present study is also comparable with study conducted by M.H Prabhu et al [19] where male preponderance is noted with 56.81% males and 43.19 % females with male to female ratio of 1.3:1.The most common type of surgical procedure received in our study was biopsies with 64.8%, while resection specimens were only 35.2% . Whereas in studies conducted by M.H. Prabhu Mural[19] and Uplaonkar S et al [11] received more of resection specimens with 79.54 % and 69.45%. respectively

5.1. Non- Neoplastic Lesions

5.1.1 Non-Specific Enteritis: In present study non specific enteritis was most common lesion observed in duodenuma(50%) ,ileum(51.9%) and ileocaecal region(50%). Clinical diagnosis varied from peritonitis, secondary to perforation/tuberculosis/ Crohn's to a tumour. Most of them presented with pain abdomen and signs of peritonitis. But on histopathological examination, the findings did not match the criteria of tuberculosis or Crohn's or tumour and some vague lesions like patchy ulceration, sub-mucosal oedema, congestion and mixed inflammatory infiltrate were found.

5.1.2 Ischeamic Enteritis with or without Gangrene: In present study, a lower incidence of Ischaemic enteritis was noted accounting for 8.9% (13 cases). The ischemia was associated with gangrene in few and in few others there were no gangrenous changes. These findings are similar to studies conducted by Nanavati MG et al[9] and Sisodia SM et al [12] with similar lower incidence of 10.1% and 11.6% respectively as in present study. Jejunal resected ischemic necrotic specimens contributed 04 cases(30.7%), while ileal segments contributed 09 cases (69.3%) of 13 cases. Macroscopic findings were the intestine was oedematous and congested. Thinning of the intestinal wall was noted focally. On cutting open, the mucosa was necrotic covered by patches of white slough. Microscopic findings were mucosa was eroded with patchy lesions, with crypts showing necrosis and there was a surface membrane composed of mucus, fibrin, blood cells and necrotic tissue. There was vascular congestion with oedema and haemorrhage in the intestinal wall.

5.1.3 Tuberculosis of Intestine: In present study, tuberculosis of intestine was noted in 7.5% (11 cases)of total cases of which maximum number of cases were from ileum(07), followed by ileocaecal region(03 cases) and one being from jejunum .The present study is nearly comparable with the studies conducted by Nanavati MG et al [9] and Sisodia S M et al [12] with 11.5% and 11.6% respectively. The microscopic findings in tuberculosis of intestine were multiple confluent epitheloid cell granulomas with langhan's giant cells and foreign body giant cells were seen in all the layers of intestine with caseation necrosis at places. Zeihl-Neelson stain demonstrated acid fast bacilli in few cases. A study by Pulimood et al [13] found the following histopathological features specific for tuberculosis, and were used to differentiate between tuberculosis and Crohn's disease caseation; confluent granulomas; lymphoid cuff; granulomas larger than 400 micrometer; 5 or more granulomas in

biopsies from one segment; granulomas located in the submucosa or granulation tissue: often with palisaded histiocytes and disproportionate submucosal inflammation

5.1.4 Perforation: Small intestinal perforations in adults may follow ingestion of foreign bodies, peptic or other ulceration, acute or chronic inflammatory bowel disease, thinning and weakening of the bowel wall due to systemic sclerosis or diverticula, or follow obstruction of the bowel lumen from a large number of causes. Microscopic findings were acute inflammatory exudate along with haemorrhage, oedema and congested blood vessels was seen. In present study, the incidence of perforation of intestine was found to be 5.51% of cases , while studies conducted by Nanavati MG et al [9] ,Sisodia SM et al [12] and M.H. Prabhu Mural et al [19] and found a higher incidence of 20% , 18.7% and 13.63 % respectively.

5.1.5 Developmental Defects: Under this group, present study reported only 1 case of Meckel's diverticulum in the study period which all together accounted for only 0.68% of all cases Study conducted by Nanavati MG et al [9] , Sisodia SM et al [12], M.H. Prabhu Mural et al [19],,found a comparably higher incidence of 8% ,3.8% and 4% respectively.

5.1.6 Crohn's disease: In present study total of 08 cases of Crohn's disease were found of which majority of them were from ileum(05),next highest being from ileocaecal region(03 cases) followed by jejunum with one case. Histopathology showed transmural lymphoid infiltrate, submucosal oedema, and granulomas which were non-caseating and discrete. In Crohn's disease, granulomas are discrete, and the lymph node do not show granuloma if none are seen in the intestine. In contrast, the granulomas in tuberculosis are confluent and could be found in lymph node even if the intestine shows none [13]. There were difficulties in distinguishing Crohn's disease from tubercular enteritis. A fact observed by Dutta AK et al. [14], Navaneethan U et al [15]. Pulimod A et al.[13] described the crohns disease granulomas are small (<200 micrometer),discrete, very few / single, poorly organized, commonly located in the mucosa along with cryptcentric inflammation and with aggregates of histiocytes. Microgranulomas helped in diagnosing Crohn's disease. The three features that are generally regarded as the hallmarks of intestinal Crohn's disease are focal ulceration(which is often fissuring and may result in fistula formation), transmural inflammation in the form of lymphoid aggregates and granulomas.

5.2 Neoplastic Lesions

5.2.1 Benign Neoplastic Lesions: Benign growths as varies types of polyps were noted in duodenum and ileum which included tubulo villous polyp ,hyperplastic polyps, inflammatory polyps and adenomatous polyps. One case of Brunner's gland adenoma presented with abdominal pain as a polypoidal lesion in the duodenal posterior wall and displayed Brunner's gland hyperplasia, forming lobules with intervening strands of fibrous tissue.

5.2.2 Malignant Neoplastic lesions

Adenocarcinoma: In present study, the most common neoplastic lesion of small intestine was found to be adenocarcinoma with 4.3%of cases (total 06 cases), which is comparable with study conducted by Nanavati MG et al [9] who found adenocarcinoma as the most common neoplastic lesion of small intestine. These findings were also similar to observations by Terada T [16], Dabaja BS et al [17] and M.H. Prabhu Mural et al [19]. Of the 06 cases 05 were from Duodenum and one was in Ileocaecal region.

Gastrointestinal Stromal Tumor (GIST): GISTs are mesenchymal neoplasms of the gastrointestinal tract that express C-kit, with rare exceptions. Two thirds arise from stomach and one fourth from small intestine and the rest occurs in large intestine. The macroscopic features shows usually solitary, rounded or ovoid mass varying in size from 2- 20 cm. On cross section they are circumscribed, lack a true capsule and reveal a pink or grey cut surface with rubbery consistency. They may have areas of haemorrhage, necrosis, myxoid change or cavitary degeneration [18]. In our study, the incidence of GIST was found to be 1.37% with total of two cases ,one in jejunum and other in ileum. These two cases showed C-kit and DOG 1 positivity on IHC staing. These findings were lower when compared to studies conducted by Nanavati MG et al [9] and M.H. Prabhu Mural et al [19] which showed an incidence of 2.3% and 2.27% respectively.

Other Neoplastic lesions: There was one case of Granulocytic sarcomain a 60 years old male patient who was a known case of CML with polyp in ileum. MPO was positive while C-kit was negative. Second interesting case was a case of metastatic deposit from lung in jejunum in a 65 years male patient. And third interesting case was of a 62 years female patient with metastatic deposits of papillary serous cysadenocarcinoma of ovary to ileum.

V. Conclusion

Disorders of the small intestine both non neoplastic and neoplastic account for a large portion of the human diseases. There are only a few extensive and comprehensive studies of small intestinal lesions from this part of country. The clinical features and radiological findings are non-specific in various diseases and thus histopathological study is mandatory especially for cases like Tb intestine for confirming the diagnosis ,early intervention, and most important to avoid avoidable complications and on the whole for a better patient management.

Acknowledgements

We thank Department of Pathology , Department of Surgery and Department of Surgical Gastroenterology, Osmania General Hospital,Hyderabad.Telangana for conducting this study. We also acknowledge technical staff, postgraduates and teaching staff of our department for all the support.

Financial Support and sponsorship: Nil

Conflicts of interest: There are no conflicts of interest.

References

[1]. Turner JR. The Gastrointestinal Tract. Chapter 17 In: Robbins and Cotran Pathologic Basis of Disease; 9th ed. Elsevier: Illinois, 2014; 777-819.
[2]. Fenoglio-Preiser CM, Noffsinger AE, Stemmermann GN, Lantz PE, Isaacson PG. In: Gastrointestinal Pathology, 3rd ed. Lippincott Williams and Wilkins: Philadelphia, 2008; 275-1036.
[3]. Cuvelier C, Demetter P, Mielants H, Veys EM, De Vos M. Interpretation of ileal biopsies: morphological features in normal and diseased mucosa. Histopathology. 2001; 38(1):1-12.
[4]. Dawson JMP. In: The small intestine. Morson B.C. 4rd ed. Churchill Livingstone, 2003; 237- 401.
[5]. Curado MP, Edwards B, Shin HR, Storm H, Ferlay J, Heanue M, Boyle P. Cancer Incidence in Five Continents Vol. IX. Lyon: IARC, IARC Scientific Publication, No.160, 2007.
[6]. Pan SY, Morrison H. Epidemiology of cancer of the small intestine. World J Gastrointest Oncol. 2011; 3(3):33-42.
[7]. Howe JR, Karnell LH, Scott-Conner C. The American College of Surgeons Commission on Cancer and the American Cancer Society. Adenocarcinoma of the small bowel: review of the National Cancer Data Base, 1985-1995. Cancer. 1999; 86(12):2693-706.
[8]. Haselkorn T, Whittemore AS, Lilienfeld DE. Incidence of small bowel cancer in the United States and worldwide: geographic, temporal and racial difference. Cancer Causes Control. 2005; 16(7):781-787.
[9]. Nannavati MG, Parikh JH, Gamit KS, Modh SD. A Histopathological Study of Intestinal Lesions. IJSR. 2014; 3(9):326-330.
[10]. Ansari HA, Haiyat S, Kehkashan E, Sherwani RK, Rehman S and Aden D. Int.J.Microbiol.App.Sci 2015;1:118-126.
[11]. Uplaonkar S, Uplaonkar V, Mujumdar VG and Patil VM. Histopathological study of benign lesions of large intestine - A cross sectional study. BMR Medicine. 2014; 1(1):1-11.
[12]. Sisodia SM, Binayke R and Jindani N. Clinicopathological Study of Tuberculous Lesions of Small and Large Bowel (Excluding Appendix). Bombay Hospital Journal, 2011; 53:1
[13]. Pulimood AB, Ramakrishna BS, Kurian G et al. Endoscopic mucosal biopsies are useful in distinguishing granulomatous colitis due to Crohn's disease from tuberculosis. Gut.1999; 45:537.
[14]. Dutta AK, Sahu MK, Gangadharan SK, Chacko A. Distinguishing Crohn's disease from intestinal tuberculosis - a prospective study. Trop Gastroenterol. 2011; 32(3):204-209.
[15]. Navaneethan U, Cherian JV, Prabhu R, Venkataraman J. Distinguishing tuberculosis and crohn's disease in developing countries: how certain can you be of the diagnosis? Saudi J Gastroenterol. 2009; 15(2):142-144.
[16]. Terada T. Malignant tumours of the small intestine: A histopathological study of 41 cases among 1,312 consecutive specimens of small intestine. Int J Clin Exp Pathol. 2012; 5(3):203-209.
[17]. Dabaja BS, Suki D, Pro B, Bonnen M, Ajani J. Adenocarcinoma of the small bowel: presentation, prognostic factors, and outcome of 217 patients. Cancer. 2004; 101(3):518-526.
[18]. Hornick LJ. Tumor of the small and large intestines, including anal region. In: Christopher Fletcher. Fletcher's Histopathology of Tumors. 4th ed. Volume 1. Churchill Livingstone. Elsevier Health Sciences: London, 2013; 434-476.
[19]. M.H. Prabhu Mural, N.V. Kalyan , Mallikarjun A. Pattanashetti and Shivakumar S. Inamdar .Clinico-pathological spectrum of small intestinal lesions at a tertiary care hospital .Al Am een J Med Sci 2020; 13(4): 255-260

Syeda Sumaiah Fatima, et. al. "Histopathological Spectrum of Small Intestinal Lesions a Tertiary Care Centre Experience." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(01), 2021, pp. 34-39.