Original Article

Histopathological Spectrum of Gastrointestinal Lesions Seen in University of Uyo Teaching Hospital, South–South Nigeria

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Abstract

Introduction: This is a retrospective study of all gastrointestinal tract (GIT) specimens seen in University of Uyo Teaching Hospital over a 10-year period from January 1, 2008 to December 31, 2017. **Materials and Methods:** Data were extracted from the departmental registers, patient request forms, and duplicate copies of histology reports of all cases seen. **Results:** GIT specimens accounted for 4.3% of all specimens. Majority of them were inflammatory lesions, distantly followed by malignant lesions. Inflammatory diagnoses were seen in all parts of the GIT with the appendix accounting for 76.3% of the inflammatory lesions. Appendicitis was the most common diagnosis, while negative appendix was the second most common diagnosis. In all sites except the anus, males were affected more than females in a sex ratio of 1.5:1. Age groups 10–39 years accounted for 79.9% of all appendix inflammatory lesions, with age group 20–29 contributing the highest. Age groups 40–59 had most gastritis cases. Age group 50–59 years accounted for most malignant lesions, with the majority seen in the colon. Adenocarcinomas distantly followed by squamous cell carcinomas were the most common histologic malignant diagnoses made. **Conclusion:** The pattern of GIT lesions seen in our institute has been documented and this will serve as a baseline data for future local studies.

Keywords: Appendix, gastrointestinal tract, inflammatory, malignant cases

Introduction

Extending from the oral cavity down to the anus is the hollow tube called gastrointestinal tract (GIT).[1] It consists of anatomically distinct segments, including the esophagus, stomach, small intestine, colon, rectum, and anus.[1] In the GIT, just as there are regional variations in structure and function, so are the diseases.[1] Disorders of the GIT could be congenital disorders, inflammatory, or neoplastic (benign or malignant). Histopathology is regarded as the most sensitive and specific diagnostic method (gold standard) for the early detection of GIT lesions (especially malignant cases) and plays an important role in the diagnosis and therefore aids in their early management.[2,3] In general, inflammatory lesions of the GIT are more common, followed by malignant lesions while benign neoplasms are rare.[2-4] Leading the inflammatory lesions are acute appendicitis (AA) and gastritis, while the pattern of malignant GIT lesion varies from geographic location to another depending on genetic factor and environmental factors (diet and social habits).[3-5] This study aims to describe the histopathological pattern of all GIT lesions ever seen in University of Uyo Teaching Hospital (UUTH), since there is no known encompassing histopathological study on gastrointestinal lesions published from UUTH.

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Materials and Methods

This is a retrospective study of all GIT specimens that were histologically diagnosed in the Histopathology Department of UUTH over a 10-year period from January 1, 2008 to December 31, 2017. This histopathology laboratory is the only facility where histopathology services are rendered in Akwa Ibom State and as such renders services to the host hospital and many privately owned hospitals within the State. These GIT specimens included excision biopsies, incision biopsies, appendectomies, small and large intestine resections, and endoscopy and colonoscopy biopsies. These specimens were fixed in 10% buffered formalin, routinely

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processed, and paraffin-embedded sections were taken and stained with hematoxylin and eosin. Special stains like Giemsa stain was used when necessary, while immunohistochemistry was done in two cases (suspected cases of gastrointestinal stromal tumor).

Data were extracted from the departmental registers, patient request forms, and duplicate copies of histology reports of all cases. Information extracted includes age, sex, duration of symptom before presentation, clinical diagnosis made by the unit consultant, type of specimen received, and histologic diagnosis. Data were analyzed using predictive analytical software, Version 17 (IBM, SPSS Inc., Chicago, IL, USA).

Simple frequencies were determined for categorical variables and mean was evaluated for continuous data. Few reports with ambiguous conclusions were excluded. Also excluded were GIT histopathology reports with any of the major identification parameters (such as sex, age and diagnosis) missing. Eight reports in all were excluded.

Results

Of 6296 specimens seen in the laboratory, 271 were GIT specimens accounting for 4.3% of all specimens. Majority of them were inflammatory lesions, distantly followed by malignant lesions as shown in Table 1. Inflammatory diagnoses were seen in all parts of the GIT with the appendix accounting for 76.3% of the inflammatory lesions, distantly followed by the stomach (11.1%), while the least was a case of fistula in ano as shown in Tables 2 and 3. Majority (47.6%) of chronic gastritis (CG) cases did not have sign of activity. For both small and large intestine, gangrenous lesions were the most common inflammatory lesions accounting for 69.2% and 62.5%, respectively, as shown in Table 3. In all sites except the anus, males were affected more than females in a sex ratio of 1.5:1. Age groups 10–39 years accounted for 79.9% of all appendix inflammatory lesions, with age group 20–29 contributing the highest. Age groups 40–59 had most gastritis cases as shown in Table 4. Appendicitis (including pathologies such as AA, suppurative appendicitis, gangrenous/perforated appendicitis, and lymphoid hyperplasia) is the most common diagnosis, while negative appendix is the second most common diagnosis. Table 5 shows a comparison of various appendicitis studies in relation to the index study. The appendectomy cases in the index study are small compared to all them. The gastritis seen in this series is compared with various gastritis studies as shown in Table 6 and had the smallest number of cases compared to the various gastritis studies. Age group 50–59 years accounted for most malignant lesions, while the lowest was seen at the extreme of ages. Most cases were seen in the colon (34.1%), followed by the anus (24.4%) and rectum (19.5%). The small intestine had the least involvement (4.9%) as seen in Table 7. For all the segments of the GIT except the anus,

Table 1: Major categories of gastrointestinal tract lesions

Type of lesion	Frequency (%)
Inflammatory	190 (70.1)
Malignant	41 (15.1)
Benign	4 (1.5)
Miscellaneous	18 (6.6)
No pathology seen	18 (6.6)
Total	271 (100)

All cases of no pathology seen were in appendix specimens

Table 2: Sex and site distribution of inflammatory gastrointestinal tract lesions

Site	Male	Female	Total (%)
Appendix	86	59	145 (76.3)
Stomach	12	9	21 (11.1)
Small intestine	7	6	13 (6.8)
Colon	4	4	8 (4.2)
Esophagus	2	0	2 (1.1)
Anus	0	1	1 (0.5)
Total	111	79	190 (100)

Table 3: Pathological diagnosis and site of inflammatory gastrointestinal tract lesions

Site	Pathological diagnosis	Frequency (%)
Appendix		145 (76.3)
	Acute appendicitis	91 (62.8)
	Follicular hyperplasia	45 (31)
	Suppurative appendicitis	5 (3.4)
	Nonspecific granulomatous inflammation	2 (1.4)
	Schistosomiasis	1 (0.7)
	Degenerative appendix	1 (0.7)
Stomach		21 (11.1)
	Chronic gastritis (WASA)	10 (47.6)
	Chronic gastritis complications	
	Acute on chronic gastritis	2 (9.5)
	Atrophic gastritis	2 (9.5)
	Intestinal metaplasia	3 (14.4)
	Perforated ulcer	4 (19)
Small Intestine		13 (6.8)
	Gangrenous intestine	9 (69.2)
	Granulomatous inflammation	1 (7.7)
	Diverticulosis	1 (7.7)
	Enterocolitis	1 (7.7)
	Inflammatory pseudotumor	1 (7.7)
Colon		8 (4.2)
	Gangrenous intestine	5 (62.5)
	Enterocolitis	2 (25)
	Inflammatory bowel disease	1 (12.5)
Esophagus		2 (1.1)
	Stricture (fibrosis)	1 (50)
	Ulceration	1 (50)
Anal canal	Fistula in ano	1 (0.5)
Rectum	-	-
Total		190 (100)

WASA: Without any sign of activity

males were affected more than females as shown in Table 8. Adenocarcinomas (70.7%), distantly followed by squamous cell carcinomas (14.6%), were the most common histologic diagnoses made as shown in Table 9. Other histological diagnoses include gastrointestinal stromal tumor (4.9%), non-Hodgkin's lymphoma (4.9%), neuroendocrine tumor (2.4%), and malignant spindle cell tumor (2.4%). Table 10 shows a comparison of the index study with various studies that focused on malignant gastrointestinal lesions.

Table 4: Age and site distribution of inflammatory gastrointestinal tract lesions

Age groups	Appendix	Stomach	Small intestine	Colon	Esophagus	Anus	Total
0-9	4	-	1	-	-	-	5
10-19	32	-	2	-	-	-	34
20-29	41	2	3	-	-	-	46
30-39	37	3	2	2	-	1	45
40-49	19	7	2	-	1	-	29
50-59	4	6	-	2	-	-	12
60-69	6	2	2	2	1	-	13
70-79	1	-	1	2	-	-	4
80-89	1	-	-	-	-	-	1
90 and above	-	1	-	-	-	-	1
Total	145	21	13	8	2	1	190

Discussion

The vermiform appendix is a rudimentary structure with no known function that arises from the medial wall of the cecum but in which various pathologies, especially inflammatory conditions usually occur.[17] AA is the most common acute surgical condition and is the most common inflammatory GIT pathology, while appendicectomy is the most frequently performed operation worldwide.[2,3,17] The pathogenesis of AA is due to lumen obstruction (either by fecalith, foreign body, calculus, tumor in cecum, or an appendiceal tumor) leading to impaired mucosal resistance to microbial invasion, mucosal injury, ulceration, and inflammation.[17-19] In the past, some authors have argued that routine histology for appendices was not important, especially when it looked grossly normal.[20] Studies have shown that routine histopathological examination of the appendix must be undertaken in all cases.[6-10] The index sample size of 145 cases in 10 years is too small compared to all the previous studies.[2-4,6-10] Reasons were mainly due to nonsubmission of all appendectomy specimens in the past. The surgeons submit what they felt looked abnormal. Furthermore, appendectomies done in peripheral hospitals even up till present are not submitted for histological examinations. The doctors in peripheral hospitals still think it is a waste of scarce resources that the incidental worrisome pathologies of appendix are very rare. Worthy of note is that results of all preoperative investigations are nonspecific and diagnosis is made only

Table 5: Comparing various appendix studies

Author	Country	DOS (years)	Number of cases	Appen Except LH	LH	OUIP (%)	NAR (%)	BEN (%)	MAL (%)
Index study	Uyo, Nigeria	10	145	58.3	27.5	3	11.2	-	-
Omotoso *et al*.[6]	Calabar, Nigeria	11	329	44.7	42	3.6	6.4	-	-
Chamisa[7]	South Africa	3	324	74.4	-	8.6	17	-	-
Prasaad and Rao[2]	South India	1	194	98	-	1	-	1	-
Sinha and Dey[8]	Bengal India	1	140	51.4	25.7	22.8	-	-	-
Ahmad *et al*.[4]	Pakistan	0.3	132	59.1	-	4.5	21.2	8.3	1.5
Jat *et al*.[9]	Saudi Arabia	3	480	97	-	-	3	-	-
Omiyale and Adjepong[10]	United Kingdom	1	238	88.7	-		11.3	0.8	0.4

DOS: Duration of study (years), Appen. Except LH: Appendicitis except lymphoid hyperplasia, LH: Lymphoid hyperplasia, OUIP: Other unusual inflammatory pathologies, NAR: Negative appendix rate, BEN: Benign neoplasm, MAL: Malignant neoplasm

Table 6: Comparing various gastritis studies

Author	DOS	Cases	Male:female	Mean age	Microscopy diagnoses (%)					
					HP	CG	Activity	Atrophy	Meta	LF
Index study	10	21	1.3:1	47.3	33.3	80.9	9.5	9.5	14.3	-
Udoh and Obaseki[11]	5	142		-	55.6	82.4	-	53	16.6	-
Oluwasola and Ogunbiyi[12]	18	85			22.4	100	-	16.7	9.4	-
Kalebi *et al*.[13]	0.3	65	1:1	43	91	98	91	57	11	11
Carrilho *et al*.[14]	2	109			94.5	90.8	-	8.3	8.3	-
Sharma *et al*.[15]	1	89	1.7:1	-	50.6	100	39.3	12.36	7.9	29
Shafii *et al*.[16]	0.3	136	1:1.3	47.3	-	100	49	18	10	46
Ahmad *et al*.[4]	0.3	643	1.3:1	Male: 44, female: 41	45.6	66.1	-	1.9	-	-

DOS: Duration of study, HP: *Helicobacter pylori*, CG: Chronic gastritis, Meta: Metaplasia, LF: Lymphoid follicle

Table 7: Age and site distribution of malignant gastrointestinal tract lesions

Age groups	Colon	Anus	Rectum	Stomach	Oesophagus	Small intestine	Total (%)
0-9	-	-	-	1	-	-	1 (2.4)
10-19	-	-	-	-	-	-	-
20-29	1	1	-	-	-	-	2 (4.9)
30-39	-	1	2	1	-	-	4 (9.8)
40-49	3	1	2	1	2	-	9 (22)
50-59	2	6	2	1	-	-	11 (26.8)
60-69	4	-	2	-	1	2	9 (22)
70-79	3	1	-	-	-	-	4 (4.9)
80-89	1	-	-	-	-	-	1 (2.4)
90 and above	-	-		-	-	-	-
Total (%)	14 (34.1)	10 (24.4)	8 (19.5)	4 (9.8)	3 (7.3)	2 (4.9)	41 (100)

Table 8: Sex and site distribution of malignant gastrointestinal tract lesions

Site	Male	Female	Total (%)
Large intestine	8	6	14 (34.1)
Anus	4	6	10 (24.4)
Rectum	4	4	8 (19.5)
Stomach	4	0	4 (9.8)
Esophagus	3	0	3 (7.3)
Small intestine	2	0	2 (4.9)
Total (%)	25	16	41 (100)

after histopathology. Histology remains the gold standard, irrespective of advances in technology and imaging modalities because apart from the common diagnosis of appendicitis, occasionally sinister findings such as neoplasms (both benign and malignant) and unusual but important incidental findings such as different types of worms and tuberculosis may also be encountered, which ultimately changes the management.[6-10] Hence, histology helps to determine treatment options.

Most of the appendices were from males in a sex ratio of 1.3:1, while the mean age was 29 ± 12.8 with age groups 20–29 years accounting for most cases. About 78.2% of cases were seen in ages less than 40. This is similar to previous studies except the observations by Omotosho *et al*. and Sinha *et al*. that reported more females.[6-10] In general, appendicitis is relatively rare in infants and reaches a peak incidence in teens and early 20s. The incidence is equal among males and females before puberty. In young adults, the male:female ratio increases in favor of males.[8] Although lymphoid hyperplasia is recognized as a cause of lumen obstruction which may eventually lead to inflammation of appendix, most studies do not recognize it as a diagnostic entity except studies by Omotosho *et al*. and Sinha *et al*. In the index study, it accounted for 27.5% of appendicitis diagnoses. There is no consensus about this diagnostic entity. Even in the same institution like ours, different pathologists differ in their opinion about this diagnostic entity. In situations like this, what settles/resolves the argument is that neither lymphoid hyperplasia nor negative appendicitis which will be the other diagnosis, means no harm to the patient and will probably not change the treatment plan.

Negative appendectomy (NA) or normal appendix following appendectomy or false-positive appendectomy is defined as postoperative appendix specimen for suspected appendicitis that was however microscopically normal on histopathological examination without evidence of inflammation, tumors, and parasitic infestation.[7,9,21] All studies except Sinha *et al*. and Priavadhana reported NA which had a range of 3%–21.2%.[2,4,6-10] A rate of 11.2% was observed in this study, which is within the acceptable range of 10%–20%.[20,22] The high rates of 10%–20% for NA is acceptable internationally, so as to avoid missing cases of appendicitis and its possible complications (such as perforation, peritonitis, abscess formation, peritonitis, and sepsis) which causes more morbidity and mortality.[22] It was observed that studies that had high rate of lymphoid hyperplasia, reported a lower rate of NA or none.[6,8] It could be deduced that if not for lymphoid hyperplasia as a diagnostic entity, the rate of NA would be higher. About 72% of the NA group were female, aged between 10 and 40 years (though not statistically significant) which is similar to previous documentations.[4,6,7,9,10] Right iliac fossa pain with rebound tenderness is the major clinical suggestion of appendicitis. Mimickers of appendicitis clinically that usually lead to NA include gynecologic lesions (ovarian cysts, leiomyoma, endometriosis, benign ovarian neoplasms, malignant ovarian disease, pelvic adhesions, and pelvic inflammatory diseases), Merkel diverticulitis, omental infarction, mesenteric lymphadenitis, and chemotherapy-induced typhlitis.[9,10,23,24] Recently, to reduce the rate of NA, in addition to the previously well-known clinical assessment (detailed history taking, examination, and investigations to show the presence of infection), selective diagnostic imaging modalities (including plain abdominal radiographs, ultrasound scan (USS), and computerized tomography (CT scan) have been introduced).[10] Of the three radiologic modalities, CT is the best and is highly accurate for confirming or excluding AA. It has a sensitivity of 90%–100%, specificity of 91%–99%, and positive predictive value of 95%–97%.[25] In our setting, almost all appendectomies were done as emergency cases, usually based on high index of suspicion. Very few had USS done before surgery and none had a CT scan done before the surgery.

Table 9: Site and histopathological diagnosis distribution of malignant cases

Site	Adenoca	SCC	GIST	MSCT	NHL	NeuroEn	Total (%)
Esophagus	1	2	-	-	-	-	3 (7.3)
Stomach	1	-	2	-	1	-	4 (9.8)
Small intestine		-	-	-	1	1	2 (4.9)
Large intestine	14	-	-	-	-	-	14 (34.1)
Rectum	7	1	-	-	-	-	8 (19.5)
Anus	6	3	-	1	-	-	10 (24.4)
Total (%)	29 (70.7)	6 (14.6)	2 (4.9)	1 (2.4)	2 (4.9)	1 (2.4)	41 (100)

Adenoca: Adenocarcinoma, SCC: Squamous cell carcinoma, GIST: Gastrointestinal stromal tumor, MSCT: Malignant spindle cell tumor, NHL: Non-Hodgkin's lymphoma, NeuroEn: Neuroendocrine tumor

Table 10: Comparison of malignant gastrointestinal studies

Author	Index study (*n*=41)	Abdulkarem *et al*. (*n*=713)	Mbuk *et al*. (*n*=81)	Mahmoud *et al*. (*n*=404)	Ajarim *et al*. (*n*=629)	Thakur *et al*. (*n*=800)
Duration (years)	10	11	3	3	9	2.5
Sex ratio male: female	1.6:1	1.4:1	1.5:1	1.6:1	2.2:1	
Mean age	52.6	48.9	44.5	58	59	
Colorectal (%)/rank	53.7/1st	56/1st	45.7/1st	14/5th	17/3rd	61.5/1st
Anus (%)/rank	24.4/2nd		2.5/5th	1.8/6th		
Stomach (%)/rank	9.8/3rd	12/3rd	7.4/3rd	15/3rd	18/2nd	7.5/3rd
Esophagus (%)/rank	7.3/4th	2.5/5th	3.7/4th	14.5/4th	12/4th	18.8/2nd
Small Intes (%)/rank	4.9/5th	1.7/7th	2.5/5th	1.2/7th	1/7th	1.8/4th
Buccal cavity/rank	-	-	16/2nd	-	-	-
Appendix/rank	-	-	1.2/7th	0.5/8th	-	-
Others	-	27.4/2nd		43.5/1st	48/1st	

Intes: Intestine, Others include: GIT accessory organs (liver, pancreas, gallbladder), GIT: Gastrointestinal tract

Other unusual inflammatory diseases of the appendix (associated with specific causes) include oxyuriasis, eosinophilic appendicitis, schistosomiasis, *Helicobacter pylori*, measles, infectious mononucleosis, Crohn's disease, ulcerative colitis, sarcoidosis, yersiniosis, Rosai–Dorfman disease, invasive candidiasis, amebiasis, cryptosporidiosis, and cytomegalovirus appendicitis.[17] It accounted for 3% of cases seen in this study which is within the range of 1%–8.6% seen in previous studies.[2,4,6,7] Sinha *et al*. in West Bengal, India, reported a rate of 22.8%, though no reasons were given for this high occurrence.[8] The importance of making these diagnoses is that appendectomy alone does not solve the problem in these cases and the patients have to be treated specifically for the various disease entities diagnosed histopathologically. Neoplasms of the appendix are rare.[17] Although the total number of appendices seen in this study is small, the none occurrence of even one neoplasm could mean that they are very rare in our setting.

Only 21 (11.1%) cases of CG and its complications were seen in 10 years in our study. This is too small compared to most previous studies.[4,11-16,26,27] The reasons were mainly due to nonavailability of a gastroenterologist in UUTH until 5 years ago and nonavailability of endoscopy instruments and other trained personnel until few months ago. Only 9 (42.9%) of these gastric biopsies were from endoscopies. The others were from cases that presented to the surgery department. This obviously underrepresents the magnitude CG and *H. pylori* (HP) infection in our environment. Although small sized, the noting of the pattern seen in our center is still important. The mean age and sex ratio is same with previous studies from other parts of the world.[4,13,15,16] The HP infection rate of 33.3% is also within the range of 22.4%–61% seen in previous Nigerian studies.[11,12,26]

Causes of CG include HP infection, abuse of nonsteroidal anti-inflammatory drugs, alcohol, radiation, chronic bile reflux, mechanical injury (e.g., indwelling nasogastric tube), and systemic diseases (amyloidosis, Crohn's disease and graft vs. host disease).[1] CG due to HP infection is the most common.[1] In about 90% of CG cases, HP organisms are present. Known risk factors for HP include poverty, household crowding, limited education, African American and Mexican America ethnicity, and residence in rural areas.[1] Morphologically, HP organism is mainly seen within the surface mucus overlying epithelial cells in the surface and neck regions, mostly in the antrum and less common in acid producing (oxyntic) mucosa of the fundus and body.[1] Common histologic findings include intraepithelial neutrophils, subepithelial plasma cells, and lymphoid follicles. Major complications are peptic ulcer disease, mucosal atrophy, and intestinal metaplasia.[1]

Over time, especially in populations that are more genetically susceptible, HP-induced gastritis may progress through a

series of stages (nonatrophic CG, multifocal atrophic gastritis, intestinal metaplasia, low-grade dysplasia, and high-grade dysplasia) to form an invasive adenocarcinoma. The low rate of glandular atrophy and metaplasia we observed and a single case of gastric adenocarcinoma reconfirms the known pattern in Nigeria and other African Countries.[12-14]

In this series, the most common inflammatory lesion of both the small and large intestine is gangrenous necrosis and the causes ranged from bands/adhesions to herniation to volvulus and rarely due to tumors. Microscopically, depending on the stage of the lesion, it usually appears as nonspecific transmural inflammation with extensive areas of necrosis in severe cases.[1]

The number of cases of small intestine malignancies in the present study was too small (only two cases) to draw any conclusion except that malignant lesions of the small intestine were rare in occurrence.

Worldwide GIT cancers constitute about 15%–25% of all cancer burdens. It shows very remarkable and striking differences in its occurrence in different regions and different races of the world. The incidence of GIT malignancies varies from country to country and also in different parts of the same country.[3,5]

Only 41 malignant cases were seen during the period of study, which is small compared to the previous studies.[3,28-31] Although these are all the malignant GIT lesions seen in our hospital laboratory register, this may be an underestimation of the malignant GIT lesions in our environment. The low rate is similar to a previous observation from this center.[32] The low rate was attributed to the high fiber and vegetable-based diet that is very common in Akwa Ibom State.[32] A repeat study of colorectal cancers in Ibadan showed a significant increase in rate of over 80% and this was attributed to diet Westernization and the recent increase in hospital visitation.[33] A repeat future study in our center will help to identify such if it exists.

The small number observed in relation to previous studies may be because some previous studies included accessory GIT organs such as the liver and pancreas.[28,30,31] Some of these studies also were multicenter studies.[4,28,31] For GIT cancer cases, the demographic factors such as age incidence, male preponderance, and histological characteristics observed in the index study are similar to reports in previous studies.[28-31] Reason for male sex predominance is not clear. Colorectal adenocarcinomas were the most common malignancies, which is similar to observations in Southwest Nigeria, Zaria and Dhule, India.[3] However, in Sudan and Saudi Arabia, pancreatic cancer and liver cancer, respectively, were identified.[30,31] No definite causative reason was given for the high rate of pancreatic cancers in Sudan except for recent availability of hi-tech equipment. In Saudi Arabia, high rate of hepatitis B and C viral infections were stated to be possible reasons.[30,31] In Pakistan, esophageal cancers are the commonest GIT cancers with female preponderance.[4] Factors such as genetic factors, malnutrition, alcohol consumption, cigarette smoking, areca nuts consumption, thermal injury from scalding and hot beverages, physical injury caused by ingesting coarse food and deficiencies of riboflavin, Vitamin A and zinc, and low consumption of raw vegetables and fruits are the major risk factors.[4,31,34]

Recent studies (molecular pathological classification) have shown that there are about four molecular subtypes of colorectal carcinoma based on chromosomal and microsatellite instability. This grouping is both for clinical trial designs and future postsurgical adjuvant treatment decisions, especially for tumors with aggressive features.[35] It is no longer enough for a pathologist to give light microscopic diagnosis without a few immunohistochemistry markers when needed.

A major limitation of this study is that it was conducted in a hospital setting and more so it was carried out in one center. A community study is therefore desirable as this is usually more representative. The small sample size, especially with reference to the number of gastric biopsies done in UUTH also contributed to its limitation.

Conclusion

Our study of analysis of GIT lesions throws light on the pattern of GI lesions seen in our institute and we believe that our findings will create a baseline data for future local studies. The awareness on the need to submit all appendectomy specimens should be increased among doctors, especially the private practitioners.

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Conflicts of interest

There are no conflicts of interest.

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