



Histopathological study of colorectal cancer in AL – Najaf province

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Abstract

The present study was carried out in AL – Sadder education hospital – AL – Najaf province of histopathological Lab. (100) patients were examined, (31) patients were infected with colon cancer, the age of patients ranged between (25 – 84) years old. This work was involved The relationship between colon cancer and many factors such as gander, age, smoking, and blood groups, and also histopathological description. our study was revealed, the colon cancer was affected the age ranged between (60-64) at percent (19.4%) and more these age ,and patients had blood groups (O+) and (B+) were more than other blood groups, the blood group (O+) patients with colon cancer at percent (41.9%) and blood group (B+) at percent (29%). Our finding not appears any effect of smoking, and gender factors on the prevalence of colon cancer, Histopathological studying was revealed, damage in epithelial lining of colon mucosa, hemorrhage, hyperplasia in the intestinal glands structures and connective tissue that found in sub mucosa of colon as well as polymorphic leucocytic infiltration, especially lymphocytes, and increased in the goblet cells component in the mucosa of colon.

keywords: Histopathological study , colorectal cancer, human , AL – Najaf province.

Introduction

Colorectal (large bowel) cancer is disease in which malignant (cancer) cell form in the inner lining of the colon or rectum. Together, the colon and rectum make up the large bowel or large intestine. The large intestine is the last segment of the digestive system (the esophagus, stomach, and small intestine are the first three sections). The large bowel's main job is to reabsorb water from contents of the intestine so that solid waste can be expelled into the toilet. The first several feet of the large intestine is the colon and the last [6] inches is the rectum. Most colon and rectal cancers originate from benign wart – like growths on the inner lining of the colon or rectum called polyps. Not all polyps have the potential to transform into cancer. Those that do have the potential are called adenomas. It takes more than [10] years in most cases for an adenoma to develop into cancer. This is why some colon cancer prevention testes are effective even if done at [10] years intervals. This [10] years interval is too long, in some cases, such as in persons with ulcerative colitis or Crohn's colitis, and in persons with a strong family history of colorectal cancer of adenomas (18) . Colorectal cancer remains one of the most widespread malignancies in the world. According to the last global oncoepideniological analysis (1,2,3), it is the second most common cancer among women, and the third most common cancer among men. In 2008, more than [1.2] million of new colorectal cancer cases and about [609.000] deaths caused by colorectal cancer were registered (3). There is almost 10-fold difference in colorectal cancer incidence between distinct geographic region (1). The highest incidence was revealed in Europe (Germany, Czech Republic and Slovakia),North America, Japan, Australia, and New Zealand, the lowest incidence was noted in Africa, South and central America, and South-Central Asia (India and Pakistan),and the incidence among men is significantly higher than



among women (1,2). There is a tendency to elevation of colorectal cancer incidence in certain regions where it was low before (Japan, Korea, China, Spain, Czech Republic, Slovakia, Slovenia), that has attracted the attention of cancer epidemiologists (4). It may be caused by a combination of various factors, such as shift of dietary pattern, increase in average body mass index, and increase in smoking prevalence (5,8,7,4). According to the recent data, USA is the only country where a steady decline of colorectal cancer incidence among both men and women has been observed during the latest years (4,8). Possibly this may be due to implementation of wide-ranging screening measures in populations; consequently, it leads to considerable prevalence of early detection and adequate treatment of precancerous lesions (4,8). Additionally, stabilizing of incidence has also been noticed in Canada and New Zealand (4). It is clear that the development of colorectal cancer represents an interaction between the genome and environmental factors. Several risk factors are associated with colorectal cancer. Those that an individual cannot control include age, race, and family history. However, modifiable factors can be managed to help decrease the risk of colorectal cancer. These risk factors include tobacco use, poor diet, low physical activity, and even moderate alcohol consumption (9). Evidence also demonstrates an earlier incidence of colorectal cancer in men and women who smoke cigarettes (10). ABO Blood group, another important factor, genes are mapped at the chromosomes 9, in which the genetic alteration is common in many cancers (11). Different analytical studies, have indicated that risk of colorectal cancer is greater in population that consume high levels of red meat, processed or cured, saturated fat, high energy intake and limited intake of fruits and vegetables (high fiber and chemo preventive factors) (12,13,14,15). Development of colon cancer alters the macroarchitecture of the colon tissue. The main changes include an increase in microvascularisation and hence the blood content of the tissue (23), and distortion of its collagen matrix (24). Given that blood and collagen act, respectively, as strong absorbers and scatterers of light in the visible range of the spectrum, those changes alter the colon coloration. At the early stages of the disease the variations in the color between normal and abnormal tissue tend to be very subtle, and hence not easily discernible by the human eye.

The aim of the present study to evaluate different factors which have a relationship to colorectal cancer including age, gender, blood group, and smoking. Also the study of possible histopathological changes that occur in the colon and rectum of the patients affected with colorectal cancer.

Materials and methods

The present study consisted of [31] patients from [100] suspected patients with colorectal cancer, [15] females and [16] males mean age for both females and males is [60 – 64] years in Al-Sadder Medical City in AL – Najaf province, during 2014 – 2015, from August extend to February. The variables examined in our survey study included age of patients, gender, blood group, and lifestyle factors (dietary habits, smoking). Informations on the diagnosis tumor location and histological characteristics, were provided from laboratory section, pathology unit for diagnosis the stages of the cancer and to determine the histological change in the colon and rectum (colorectal cancer).



Results

The results appeared, the gender (females and males), not reach to significant difference although, the number of males more than females, as in the (table 1).

Table 1: show prevalence of colorectal cancer in gender.

Valid	Frequency	percent	Valid percent	Cumulative percent
Female	15	48.4	48.4	48.4
Male	16	51.6	51.6	100.0
Total	31	100.0	100.0	

Our observations showed, the old age group especially more than fifty years, they exposed to colorectal cancer, these data explain in the (table2).

Table 2 : revealed the percent of colorectal cancer according to age groups. The age group [60 - 64] years old was more infected with colorectal cancer in both females and males.

valid	Frequency	Percent	Valid percent	Cumulative ercent
25 - 29	1	3.2	3.2	3.2
30 - 34	2	6.5	6.5	9.7
35 - 39	4	12.9	12.9	22.6
40 - 44	1	3.2	3.2	25.8
45 - 49	3	9.7	9.7	35.5
50 - 54	3	9.7	9.7	45.2
55 - 59	1	3.2	3.2	48.4
60 - 64	6	19.4	19.4	67.7
65 - 69	4	12.9	12.9	80.6
70 - 74	2	6.5	6.5	87.1
75 - 79	1	3.2	3.2	90.3



80 - 84	3	9.7	9.7	100.0
Total	31	100.0	100.0	

The present study was revealed, that the smoking factor was not affected on the prevalence of the colorectal cancer as in the (table3).

Table 3: explain the smoking factor on colorectal cancer.

	frequency	Percent	Valid percent	Cumulative percent
Yes	6	19.4	19.4	19.4
No	25	80.6	80.6	100.0
Total	31	100.0	100.0	

Our study revealed the blood groups of colorectal cancer patients. the blood group O+ [41.9%] represent the more percent in the colon cancer patients after that blood group B+ [29.0%] as in the (table4).

Table 4: the relationship between the colorectal cancer and the types of blood groups.

Valid	Frequency	percent	Valid percent	Cumulative percent
A+	4	12.9	12.9	12.9
B+	9	29.0	29.9	41.9
AB+	5	16.1	16.1	58.1
O+	13	41.9	41.9	100.0
Total	31	100.0	100.0	

The histological structure of human colon consist of four tunics; mucosa which lined by simple columnar epithelium and goblet cells, the second layer sub mucosa that occupy by intestinal glands and lymphoid nodes accumulation ,the third layer is muscularis composed of inner circular and outer longitudinal smooth muscle fiber, the four layer is serosa consist of collagen and elastic fibers , blood vessels , nerve endings and enclosed by mesothelial cells (simple squamous epithelium that represent the visceral peritonium).



Figure 1: show normal histological layers of human colon, consist of mucosa lined by simple columnar epithelium and goblet cells, the sub mucosa occupy by intestinal glands, that surround by muscularis which composed from inner circular layer smooth muscle bundles and outer longitudinal muscle fibers . Hematoxylin and Eosin .200x

The histopathological changes that noticed in (figure 2) was included enlargement of intestinal glands and decrease in the leiberkulan crypts led to polyps with abundant in the number of goblet cells , from another hand hyper atrophy of lymphatic nodules due to inflammation in submucosa .

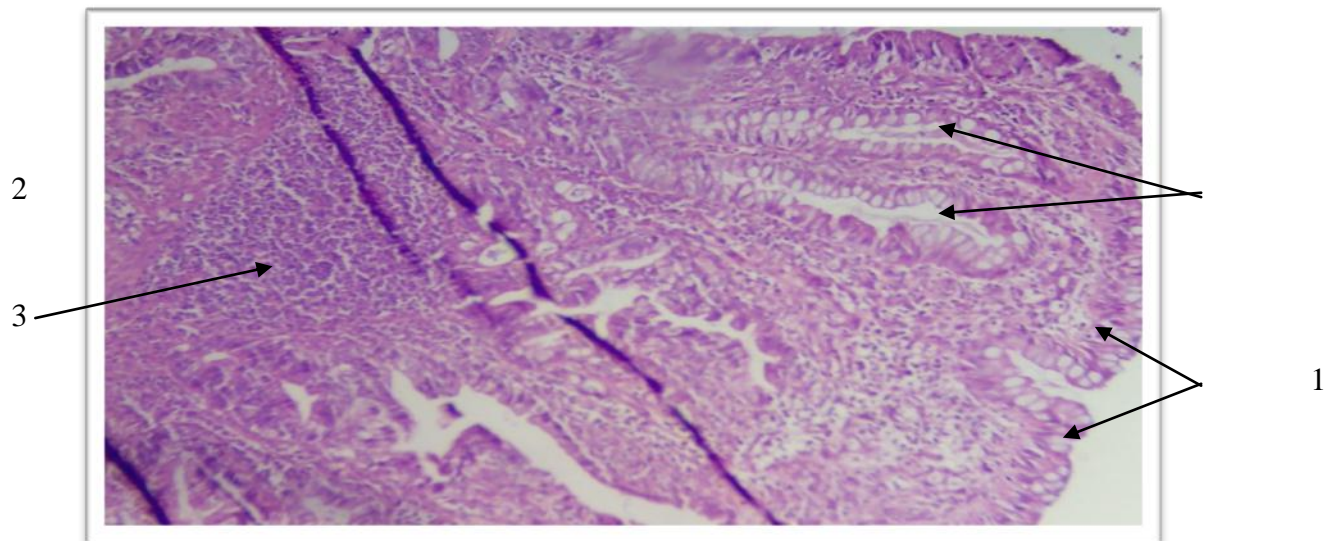


Figure 2: histopathology changes in human colon cancer the mucosa appear as polyps (1), the intestinal glands with numerous goblet cells (2) and lymphatic nodules infiltration (3). Hematoxylin and Eosin.400x

So ,the budding of the colon intestinal glands , in the submucosal tunic , and hyperplasia in the intestinal gland , with polymorph leucocytic infiltration among these glands as well as highly increase of goblet cells and decrease in simple columnar cells ,these findings in the (figure 3) .

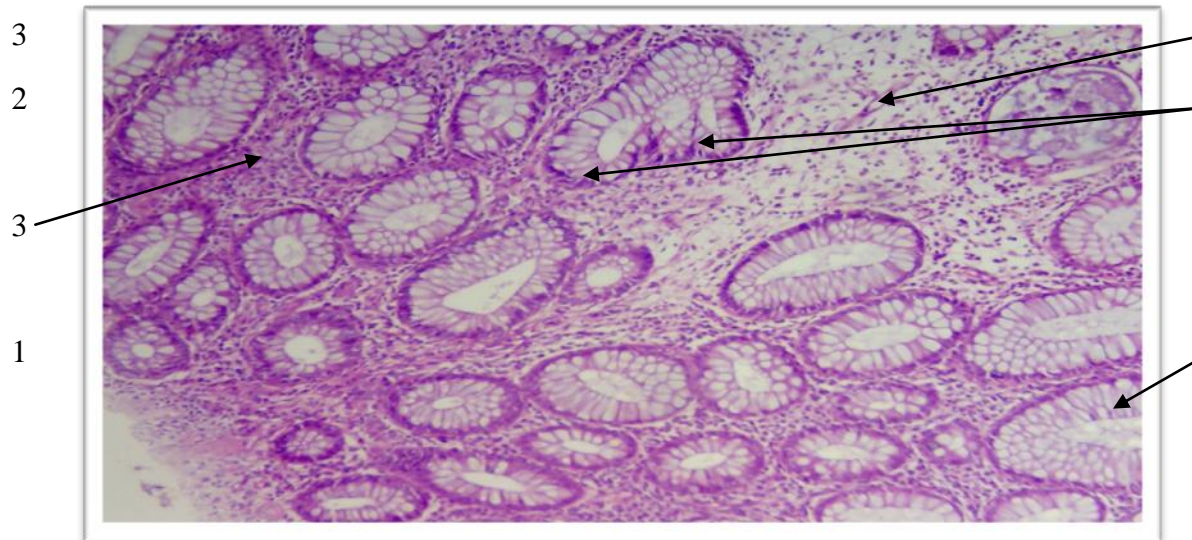


Figure 3: colon intestinal glands in submucosa, (1) show hyperplasia in goblet cells, budding of intestinal glands (2)and polymorph leucocytic infiltration (3). Hematoxylin and Eosin.200x

The histopathological signs were represented by engorgement of blood vessels due to congestion , and rupture of some blood vessels led to haemorrhage , the muscularis exposed to necrotic these signs are clear in the (figure 4).

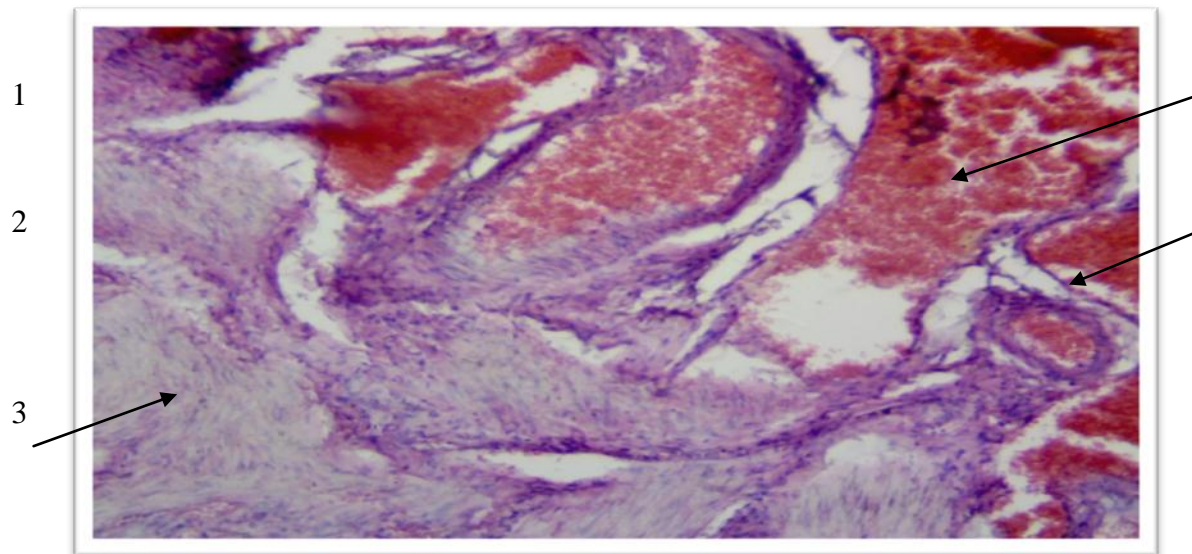


Figure 4: was revealed colon cancer histopathological changes which includes congestion in blood vessel (1) Hemorrhage in sub mucosa(2) and necrosis in muscularis (3). Heamatoxylin and Eosin .200x

While in the junction between colon and rectum the histological changes were ulceration in the epithelial lining of colon and rectal mucosa, ulcerative regions which occur in the tips of polyps. From another hand congestion in the most blood vessels which located in the submucosa (figure 5).

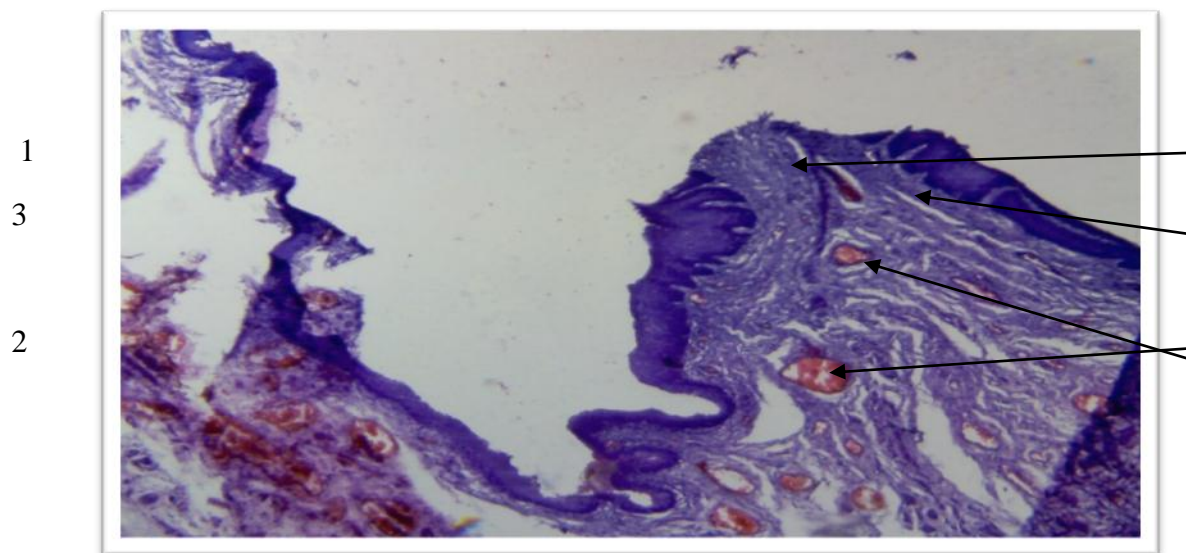


Figure 5: show polyp (1) in the colorectal junction at the tip of polyp there is ulcerative region (2), and congestion (3) in the most of blood vessels in the sub mucosa . Hematoxylin and Eosin. 400x

Discussion

Our study was focused the light on colorectal cancer risk factors in Iraq particularly in Al – Sadder Medical City in AL-Najaf province. In this study we found no significance differences between smoking and colorectal cancer (80% non smokers) from size of patient cases , these finding differed with previous studies (10) ,they mentioned the smoking often is associated with lung cancer but it also is extremely harmful to the colon and rectum (16) were the first who proposed the role of smoking in colorectal cancer development. Probably, this differences occur due to that the data about smoker's patients with colorectal cancer not accurate, due to some problems in the cases when obtained data informations from the patients. Studies (17) show reduced number of cases in young patients with colorectal cancer (about 1% for the first two decades and 2-6% until 40 years of age); our observations were similar. We found the average age to develop colorectal cancer was [60-64] years but when compared with some previous studies the average age to develop colorectal cancer was [70] years (18) . Men tend to get colorectal cancer an earlier age than women, but women live longer so they "catch up" with men and thus the total number of cases in men and women is equal (18), that was also demonstrated in our study, but in our study the men patients [51.6%] were infected with colon cancer more than women patients [48.4%]. The ABO gene are located on chromosome 9q34.1-q34.2, there are three allele forms A, B and O (11) the primary gene products are glycosyltransferase. ABO blood groups are determined by carbohydrate moieties A and B antigens ,on the extracellular surface of the red blood cell membranes and anti-A and anti-B antibodies in the serum. However ABO antigens are also expressed on the surface of many other cells like epithelial cells. Alterations on the cell surface carbohydrates structure such as ABH blood



group antigens can change the cell - cell and cell - extracellular matrix interactions that might be important for tumor development (19). So our study revealed correlation between ABO blood groups and colorectal cancer. The blood group O+ represent the more percent [41.9%] in the colorectal cancer patients, after that B+ blood group [29%] although these finding contrast with study (20) investigated blood groups relation to colorectal cancer, breast and bronchus but they showed no significance relation with (ABO) blood groups (20,21) were examined the relationship between ABO groups and colorectal cancer in prospective cohort studies but they did not observe statistically significant association (21). Histological changes of the present study which occurs in the colon cancer patient was included numerous goblet cells infiltration in the mucosa layer and hyperplasia in goblet cells, budding of intestinal glands, polymorphic leucocytic infiltration, congestion in blood vessel and hemorrhage in the submucosa layer and necrosis in muscularis which similar to the previous study (22) , in which they mentioned that the colon cancer structure is represented by three layers: mucosa, sub mucosa and smooth muscle, which interact with the light incident on the surface of the colon. In all colon layers, the strongest absorbers of light are blood hemoglobin, while scattering is mainly due to collagen and sub cellular organelles. Second histological change included increased blood volume fraction, the decrease in the collagen density and increase in mucosal thickness in the region of cancer as compared to the tissue further away from the tumor.

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