

# Clinicopathological Assessment of Colorectal Polyps in a Sample of Iraqi Patients

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**Abstract—Background:** Globally, colorectal carcinoma is considered second most common cancer in women and third most common cancer in men. **Aim:** to evaluate and determine histopathological types of different colorectal polyps in a sample of Iraqi patients, and to correlate this with clinicopathological parameters. **Methods and materials:** A retrospective cross-sectional study included 105 cases, which were retrospectively evaluated to determine histopathological type of different colorectal polyps. **Results:** mean age of cases was  $53.8 \pm 16.8$  years old. Male to female ratio of 2:1. majority of cases have a polyp in single location within large bowel. There were 43.8% of cases had sigmoid involvement. Regarding type of polyps, sessile polyp was presented in 60.9% of cases and pedunculated polyp was presented in 36.1% of cases. histopathological type showed that, 57.1% of cases had neoplastic polyps, 38.1% had non-neoplastic polyps, and 4.8% cases had both (neoplastic and non-neoplastic polyps). majority of cases with neoplastic polyps were adenomas [57 cases (95%) without FAP and 2 (3.3%) cases with FAP], while adenocarcinoma was reported in a single case only. Thirty Six cases (63.1%) of adenoma presented with tubular adenoma with low grade atypia. **Conclusion:** Predominance of male gender which was comparable to worldwide studies. neoplastic polyps were most common type of polyp that showed an association with age, number, size, and gross morphology of polyps. majority of cases with neoplastic polyps were adenomas (tubular adenoma) with low grade of atypia. Hyperplastic polyps were most common type of non-neoplastic polyps.

**Keywords—** Colorectal, polyp, Iraq, hyperplasia.

## I. INTRODUCTION

Globally, colorectal carcinoma (CRC) is considered the second most common cancer in women and the third most common cancer in men. In 2012, colonic polyps were responsible for 9.2% and 10.0% of all new cancer cases in women and men. CRC's global burden is rising, and it remains more common in men than in women both globally and in the WHO Eastern Mediterranean Region Organization (EMRO).(1) In Iraq, the incidence rate of CRC increased from 2.75/105 pop in 2002 to 3.26/105 pop in 2011.(2)

The majority (75–80%) of CRCs have a sporadic etiology while others are attributed to hereditary syndromes. The role that chronic colitis due to inflammatory bowel disease plays is limited in the etiology of CRC.(3) Colorectal polyps increase the risk of CRC, with about 10% of polyps estimated to develop into CRC.(4, 5) Colorectal polyps can be classified, based on histological appearance, into non-neoplastic types that have no malignant potential and neoplastic types that have malignant potential. The non-neoplastic types include hyperplastic polyps, hamartomas, lymphoid aggregates, and inflammatory polyps. The neoplastic types include serrated sessile adenomas (with and without dysplasia), traditional serrated adenomas, tubular adenomas, and villous and tubulovillous adenomas.(6) Polyps with high-grades of dysplasia have the highest risk of developing colorectal cancer.(7)

Descriptive characteristics of histopathological detailed features of colonic polyps in the Iraq need to be documented. Hence, our study aimed to describe the histopathological types of different colorectal polyps in a sample of Iraqi patients.

*Aim of Study*

The aim of this study is to evaluate and determine the histopathological types of different colorectal polyps in a sample of Iraqi patients and their correlation with clinicopathological parameters including age, gender, symptoms, family history, site, gross features of polyp (sessile or pedunculated), size and multiplicity.

## II. PATIENTS, MATERIALS, AND METHODS

A retrospective study conducted in Medical Consultant Organization at College of Medicine AL\_Nahrain University on diagnosed patients with colorectal polyp, and the data were collected from endoscopic and pathological reports of the patients. The collection period was from 1<sup>st</sup> January 2018 till 1<sup>st</sup> January 2020 and the research lasted for 1 year started in February 2021 and finished in February 2022. The ethical committee of the Iraqi Board for Medical Specializations, approved this study.

*Sampling process and Sample size:* There were 105 patients referred during that period and included in this study.who fulfilling inclusion criteria.

*Ethical and official approval:* Official approval was approved by: The Iraq Council of the Iraqi Board of Medical Specializations.

*Parameters:*

*Clinical:*

- Age.
- Gender.
- Symptoms.
- Family history.

*Endoscopic:*

- Site.
- Size.
- Gross features of polyp: sessile or pedunculated polyp.

- Multiplicity.

Formalin-fixed paraffin-embedded tissue blocks were collected. Then, sections 4-6 micrometers thickness stained routinely with Hematoxylin & Eosin and diagnosis was revised microscopically. Every H&E stained slides were scanned under light microscope (Leica, Germany) at power of 10x, 40x to check the histopathological features representative for the lesion then microscopic photomicrographs were taken by using I phone X [12 MP wide angle camera, f/1.8 aperture].

Statistical analysis was performed with the IBM-SPSS 23 statistical software program. Univariate data were summarized using standard descriptive statistics, tabulation of categorical variables and histograms of numerical variables. Associations between categorical variables were assessed via cross-tabulation and chi-square test. Mann Whitney Test (a non-parametric equivalent of the independent samples t-test), Wilcoxon signed rank test (a non-parametric equivalent of the paired t-test) and Kruskal-Wallis test (a non-parametric equivalent to one-way ANOVA) were used to compare means of continuous variables. Exact tests were used to calculate the p-value. In all statistical analyses, a p-value < 0.05 was considered significant.

### III. RESULTS

There were 105 cases, included in this study, which were retrospectively evaluated to determine the histopathological type of different colorectal polyps.

Based on histological features, histopathological finding were interpreted as below:

- *Neoplastic:*
  1. Adenoma (low grade dysplasia, high grade dysplasia)
    - a. Tubular adenoma.
    - b. Tubulovillous adenoma
    - c. Villous adenoma.
  2. Adenocarcinoma
- *Non – neoplastic:*
  1. Inflammatory.
  2. Hyperplastic
  3. Hamartomatous [ juvenile and Peutz-Jeghers polyps]

*Neoplastic polyps:* Out of 105 cases included in this study, there were 60 (57.1%) cases with neoplastic polyps. The majority of cases with neoplastic polyps were adenomas [57 cases (95%) without FAP and 2 (3.3%) cases with FAP], while adenocarcinoma was reported in a single case only.

*Regarding adenoma:* Thirty six cases (63.1%) presented with tubular adenoma with low grade atypia. No high grade atypia presented with tubular adenoma.

Thirty Two cases (53.3%) presented with tubulovillous adenoma. Of those, 17 (53.2%) cases had low grade atypia and 15 (46.8%) cases had high grade atypia. No cases reported with villous adenoma.

*Non-Neoplastic polyps :*Forty cases (38%) had non-neoplastic polyps. Of those, 26 (65%) cases had hyperplastic polyps, 9 (22.5) cases had inflammatory polyps, and 5 (12.5%) cases had hamartomatous polyps. The mean age was significantly lower among cases with hamartomatous polyps in comparison

with both hyperplastic and inflammatory polyps (p value = 0.001). (Figure 1).

Adenoma	Frequency	Percentage	Total
<b>Tubular</b>	36	100	
Low grade	0	0	36
High grade	0	0	
<b>Villous</b>	0	0	0
<b>Tubulovillous</b>	17	53.2	
Low grade	15	46.8	32
High grade			

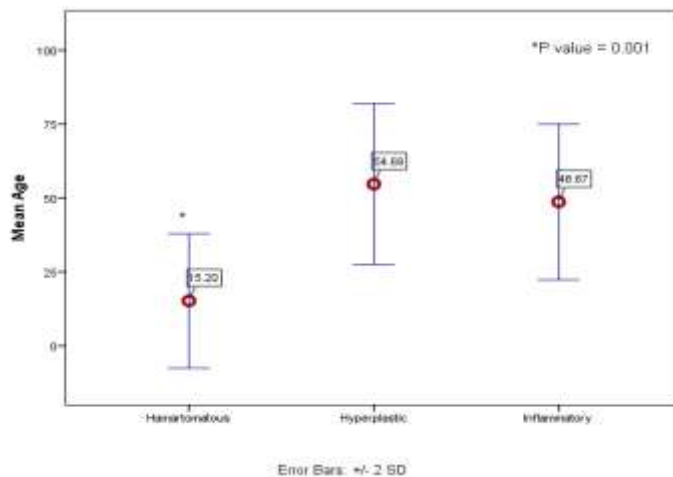


Figure 1: The distribution of mean age across non-neoplastic polyps' cases. Independent-Samples Kruskal-Wallis Test.

#### Demographic Characteristics

The mean age of cases was 53.8 ± 16.8 years old (SEM = 1.63), with a range from 4 years to 82 years old.

Males represent 64.8% of cases and females 35.2%, with male to female ratio of 2:1. (Figure 2)

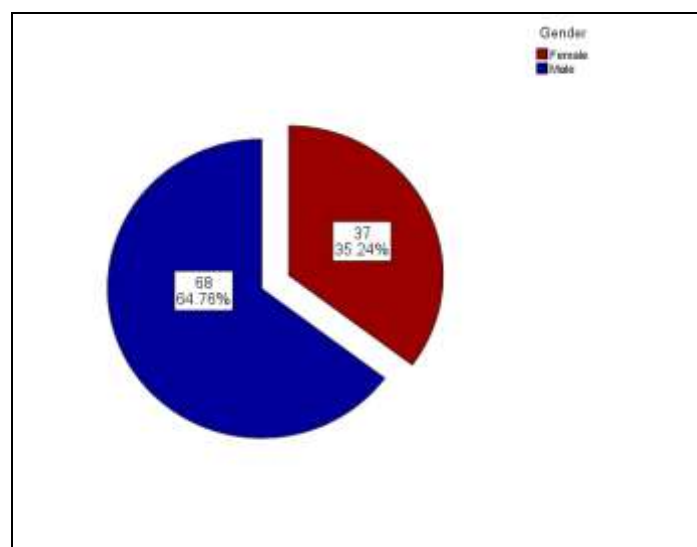


Figure 2: Gender distribution across cases

#### Clinical Features

There were 49.5% of the cases presented with bleeding per rectum followed by abdominal pain which was presented in

21.9%. While only 2 cases have weight loss and 3 cases did not have symptoms and they have their examination for screening purposes. (Table 2)

**Table 2: Clinical presentation of cases**

Clinical feature	Frequency	Percentage
Bleeding per rectum (fresh blood)	52	49.5
Abdominal pain	23	21.9
Constipation	6	5.7
Altered bowel motion	5	4.8
Anemia	5	4.8
Chronic diarrhea	5	4.8
Bloody diarrhea (diarrhea admixed with blood)	4	3.8
Weight loss	2	1.9

The majority of cases (81%) have a polyp in single location within the large bowel, 15.2% of cases have polyps in 2 locations, 1.9% of cases have polyps in 3 locations, and also 1.9% of cases have polyps in 5 locations.

There were 43.8% of cases had sigmoid involvement, 32.3% had rectal involvement, 27.6% had descending colon involvement, 12.4% had transvers colon involvement, and 10.5% had ascending colon involvement (Table 3& figure 3)

**Table 3: Frequency of cases in association with site of polyps.**

Clinical feature	Frequency	Percentage
1 site	85	81.0
2 sites	16	15.2
3 sites	2	1.9
5 sites	2	1.9

1 site means polyp in single location, 2 sites mean polyp in two locations, 3 sites mean polyp in three locations, 5 sites mean polyp in five locations

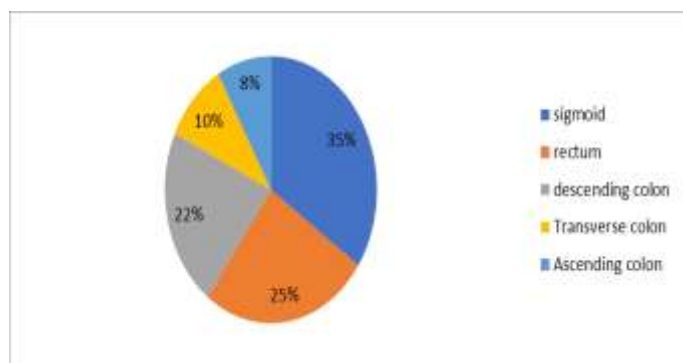


Figure 3: Location of polyps' involvement

**Size of the polyps**

For single polyp, the mean size was 0.8 cm (range 0.2 – 5 cm), while multiple polyps showed a mean size of 0.9 with a range of 0.2 – 10.5 cm (Table 4).

**Table 4: Size of polyps**

Single polyps (N=71)			Multiple polyps (N=34)		
Mean	Maximum	Minimum	Mean	Maximum	Minimum
0.8 cm	5.0 cm	0.2 cm	0.9 cm	10.5 cm	0.2 cm

**Multiplicity of the polyps**

Single polyp was presented in 71 (67.6%) of cases, while multiple polyps were observed in 34 (32.4%) of cases (Table 5).

**Table 5: Number of polyps per cases**

Clinical feature	Frequency	Percentage
1 polyp	71	67.6
2 polyps	15	14.3
3 polyps	9	8.6
4 polyps	2	1.9
5 polyps	2	1.9
10 polyps	4	3.8
100 polyps	2	1.9

**Gross features of polyps (Sessile or pedunculated)**

Regarding the type of polyps, the sessile polyp was presented in 60.9% of cases and pedunculated polyp was presented in 36.1% of cases. There were 3 (2.9%) cases have both sessile and pedunculated polyp. (Figure 4)

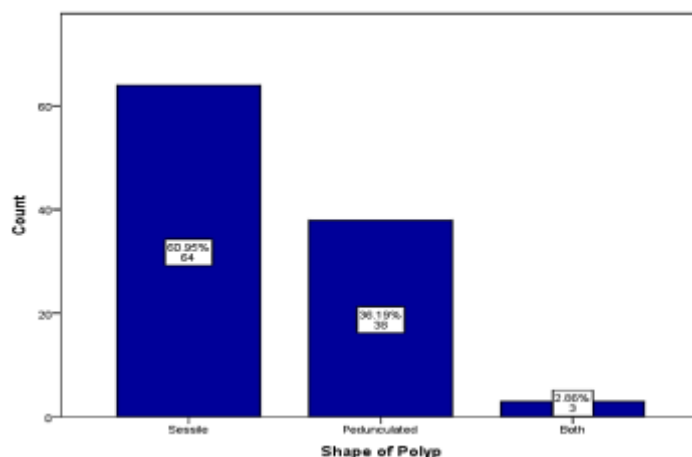


Figure 4: Distribution of polyps' shape across cases

The histopathological type showed that, 57.1% of cases had neoplastic polyps, 38.1% had non-neoplastic polyps, and 4.8% cases had both (neoplastic and non-neoplastic polyps). (Figure 5)

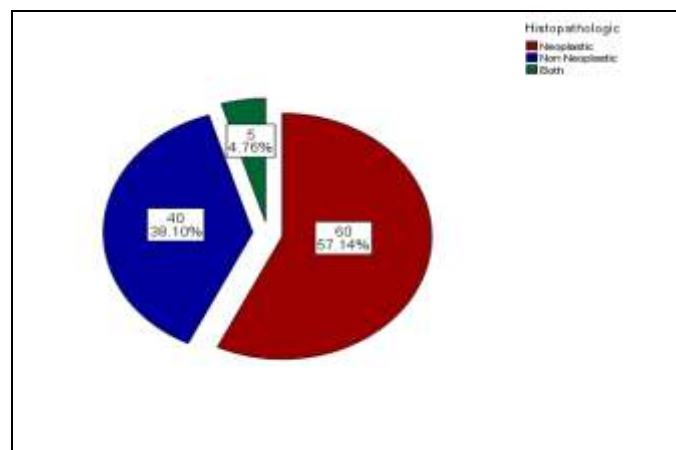


Figure 5: The histopathological finding

**Age:** regarding age, the mean age was significantly higher among cases which presented with neoplastic polyps ( $56.5 \pm 15$  years, SEM=1.4) or neoplastic and non-neoplastic polyps ( $65.8 \pm 14$  years, SEM=1.3) in comparison to non-neoplastic ( $48.4 \pm 18$  years) polyps' (p value 0.02). (Figure 6)

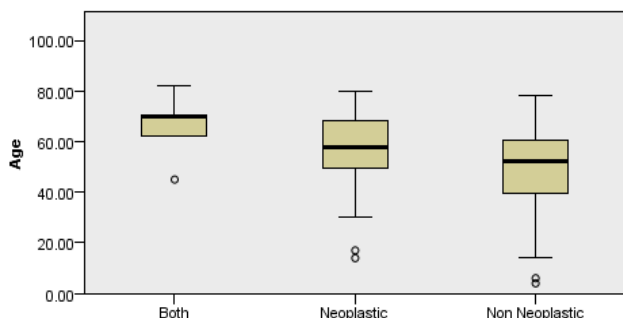


Figure 6. Mean age distribution across histopathological type of polyps. Independent-Samples Kruskal-Wallis Test (p value = 0.02)

**Gender:** regarding the correlation of gender with histopathological type of polyps, there was no statistical difference in gender among different histopathological types of polyps (p value = 0.88). (Table 6).

**Table 6: Distribution of gender across histopathological type**

Gender	Histopathological type			Total
	Neoplastic No. (%)	Non-neoplastic No. (%)	Both No. (%)	
Male	40 (58.8)	25 (36.8)	3 (4.4)	68 (100)
Female	20 (54.1)	15 (40.5)	2 (5.4)	37 (100)

Chi-Squ = 0.23, P value = 0.88

**Number of sites involved,** regarding the site of polyps, the cases with polyp involvement in more than 2 locations were associated with neoplastic type (p value = 0.001). (Table 7).

**Table 7: The distribution of number of sites involvement in correlation with histopathological type**

No. of sites	Histopathological type			Total
	Neoplastic No. (%)	Non-neoplastic No. (%)	Both No. (%)	
1	47 (55.3)	37 (43.5)	1 (1.2)	85 (100)
2	10 (62.5)	3 (18.8)	3 (18.8)	16 (100)
3	1 (50.0)	0	1 (50.0)	2 (100)
5	2 (100)	0	0	2 (100)

Chi-Squ = 22.1, P value = 0.001

**Size:** by using the pairwise comparisons of histopathological type, the size of polyp was significantly higher among neoplastic polyps in comparison with non-neoplastic polyps only (p value = 0.008), the group who had neoplastic and non-neoplastic type of polyps did not show significant difference with neither neoplastic nor non-neoplastic polyps (P= 0.18).

**Gross features of the polyps:** regarding the shape of polyps, the pedunculated polyps were associated with neoplastic group (p=0.001). See table 9.

**Number of polyps:** regarding the number of polyps, multiple polyps were significantly associated with neoplastic or neoplastic and non-neoplastic types of polyps in comparison with non-neoplastic polyps (p value =0.001).

Table 8: Pairwise comparisons of histopathological type based on size (Independent-Samples Kruskal-Wallis Test)

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Non Neoplastic-Neoplastic	18.088	6.042	2.993	.003	.008
Non Neoplastic-Both	28.912	14.041	2.059	.039	.118
Neoplastic-Both	10.825	13.779	.786	.432	1.000

**Table 9: The distribution of shape of polyps across histopath. Type**

Shape	Neoplastic No. (%)	Non-neoplastic No. (%)	Both No. (%)	Total
Both	0	1 (33.3)	2 (66.7)	3 (100)
Pedunculated	32 (84.2)	6 (15.8)	0	38 (100)
Sessile	28 (43.8)	33 (51.6)	3 (4.7)	64 (100)

Chi-Squ = 42.5, P value = 0.001

**Table 10: The distribution of No. of neoplastic and non neoplastic polyps**

No. polyps	Neoplastic No. (%)	Non-neoplastic No. (%)	Both No. (%)	Total
1	41 (57.7)	30 (42.3)	0	71 (100)
2	10 (66.7)	5 (33.3)	0	15 (100)
3	3 (33.3)	4 (44.4)	2 (22.2)	9 (100)
4	1 (50)	0	1 (50)	2 (100)
5	2	0	0	2 (100)
10	3 (75)	1 (25)	0	4 (100)
100	2 (100)	0	0	2 (100)

Chi-Squ = 62.9, P value = 0.001

#### IV. DISCUSSION

Identification of the nature of colonic polyps among a population is essential for the estimation of their potential risk to develop colorectal cancer.(8) In this study, a detailed evaluation of the clinical features, physical characteristics, and histopathological findings was carried out to identify the nature of colonic polyps in sample of Iraqi patients. Colonic polyps were detected in patients of various ages. Although the mean age was in the early sixth decade (53.8 years), the age of patients was ranged as young as 4 years and as old as 82 years. In agreement with this result, a recent study from Saudi Arabia demonstrated mean age of the patients was 57 years old,(9) also, researchers from the United States reported that around 40% of their patients who were diagnosed with colonic polyps were above the age of 50 years.(10)

In this study, gender distribution showed that around 2/3 of recruited sample were males which is supporting the evidence of male gender is an important risk factor for polyps and colon cancer. This was in agreement with a recent study from Erbil and another study from Baghdad, Iraq that showed 2/3 of their participants were males.(11, 12) Also, various literature review studies showed that males were found to be more affected by colonic polyps than females (10, 13). Despite high prevalence of colonic polyps among men, the etiology is remain unclear, a lot of theories were proposed, of those, Estrogen is proposed to have a protective effect against the development of colorectal polyp, and this action is mediated via estrogen receptor genes.(14) Reduced bile acid production in females is proposed to reduce the colonic mucosa irritation

and subsequently colonic polyp formation, and insulin-like growth factors are thought to play a role.(15)

Although, the vast majority of colonic polyps are asymptomatic,(16, 17) in this study, the most common presenting symptoms necessitating colonoscopy was bleeding per rectum, which was presented in around half of patients, and only 2% (3 cases) of patients have their endoscopy for screening purposes (for routine checkup), 2 of them with family history of colon cancer and one with personal history of rectal carcinoma. This was in agreement with a result of study from Baghdad at 2021 that showed around 50% were underwent colonoscopy due to rectal bleeding.(18) Also, a study from Nigeria showed that, rectal bleeding was the most presenting symptom for colonoscopy.(19) While all other regional and global studies demonstrated the main cause for colonoscopy is screening (20, 21). In Saudi Arabia study, about half of the patients studied (46%) had their endoscopy as routine surveillance for regular check-ups. Another third (34%) underwent colonoscopy examination because they had a first degree relative with colonic polyps/cancer and remaining patients underwent colonoscopy examination because of other symptoms (mainly bleeding, occult blood in stool, and weight loss). This showed that in Iraq, were lagging behind in term of early detection of polyps and comprehensive educational program must carry out to increase the awareness of routine surveillance for polyps.

The majority of cases (81%) have a polyp in single location and more than 80% of cases their polyps were located in sigmoid, rectum, or descending colon (left side colon). This was in agreement with other local and regional studies showed that left side of colon is the most common site of involvement by polyps (22).

The mean size for polyps was 0.8 cm, with no statistical difference in size between single and multiple polyps' cases. This result of size showed smaller size in comparison to Al-Khazraji et al study in Baghdad, which showed only 45% of their cases had polyp less than 1 cm in size. While a study from China showed that, more than 60% of cases had polyps less than 0.5 cm in size and more than 85% of cases had polyp size of less than 1 cm.(23) Furthermore, a study from Iran showed that more than 65% of cases were had polyp less than 1 cm in size.(24)

Single polyp was observed in 67% of cases and the multiple polyps were seen in remaining of cases. This was in agreement with other study that showed a single polyp is the most presenting polyp in colonoscopy examination.(25)

Regarding the type of the polyps, the sessile polyp was presented in 60.9% of patients and pedunculated polyp was presented in 36.1% of patients. There were 3 (2.9%) patients have both sessile and pedunculated polyp. And this was in disagree with Al-Khazraji et al study in Baghdad that showed a 70% of cases were had pedunculated polyp. Also, another study from Brazil had same observation, as well as with regional study from Saudi Arabia study.

#### *Histopathological type of polyps*

The histopathological type showed that, there were 57.1% of patients had neoplastic polyps, 38.1% had non-neoplastic

polyps, and 4.8% patients had both (neoplastic and non-neoplastic polyps), and this was in agreement with other studies that showed neoplastic polyps are more frequently presented (26)

Regarding the age, the mean age was significantly higher among patients who were presented with neoplastic polyps ( $56.5 \pm 15$  years) or neoplastic and non-neoplastic polyps ( $65.8 \pm 14$  years) in comparison to non-neoplastic ( $48.4 \pm 18$  years) polyps'. This was disagree with Al-Khazraji et al study in Baghdad that showed the age was not associated with degree of dysplasia and they mentioned that is might be due to small sample size in this study. An advancing age is an independent risk factor for developing of colorectal adenomas, which may lead to higher rates of colorectal cancer in the elderly.(27) In other studies, the prevalence of colorectal adenomas increased markedly with age.(28-30) And this emphasize that the older age is the most important predictor for the prevalence of adenomas, and cancer.(27)

Despite the high prevalence of polyps among male cases, the correlation of gender with histopathological type of polyps did not showed a statistical difference in gender among different histopathological types of polyps, and this was in agreement with Zhou et al study that showed same results.

Multiple polyps showed a significant association with neoplastic polyps and this was in agreement with other studies that showed a multiple polyps been shown to have greater malignant potential.(31-33)

Also, the size of polyp was significantly higher among neoplastic polyps in comparison with non-neoplastic polyps. This was in agreement with other studies that showed the larger a colon polyp becomes, the more rapidly it grows and more likely to be with neoplastic polyps (34) This indicated that the size of a polyp typically does make a difference, the larger the polyp, the higher risk for developing colon cancer.

Regarding the morphology of polyps, pedunculated polyps were associated with neoplastic type. This was in agreement with Al-Khazraji et al study in Baghdad that showed a statistical association between pedunculated polyps and neoplastic polyps.

Out of 105 cases included in this study, there were 60 (57.1%) cases with neoplastic polyps. The majority of cases with neoplastic polyps were adenomas [57 cases (95%) without FAP and 2 (3.3%) cases with FAP], while adenocarcinoma was reported in single cases only (male patient, 55 years old, presented with bleeding per rectum with out family history and the hitopathological finding was high grade dysplastics changes complicated by intramucosal carcinoma). This was in agreement with Saudi and Korean studies, that showed the most common type neoplastic polyps is adenoma with majority of tubular adenoma (35).

Forty cases (38%) had non-neoplastic polyps, of those, 26 (65%) patients had hyperplastic polyps, 9 (22.5%) patients had inflammatory polyps, and 5 (12.5%) patients had hamartomatous polyps. This disagree to Al-Khazraji et al study that showed the most common non neoplastic polyps was inflammatory polyps. Also, China study by Zhou et al showed that the inflammatory polyps are the most common non neoplastic polyps, as well as in Nigerian study. This



difference might related to the difference in sample size included in this study.

The mean age was significantly lower among patients with hamartomatous polyps in comparison with both hyperplastic and inflammatory polyps. This was in agreement with another study that showed the mean age of patients with hamartomatous polyps was 16 years.(36) This in fact that the hamartomatous polyps most common type of polyp in children.

### V. CONCLUSION

In the present study:

1. The neoplastic polyps were the most common type of polyps and the majority of these cases were adenomas (tubular adenoma) with low grade of atypia.
2. Hyperplastic polyps were the most common type of non-neoplastic polyps.
3. Hamartomatous polyp was the commonest polyp in pediatric age group.
4. FAP was presented in less than 2% of cases with no family hisoitry and presented as bleeding per rectum.
5. Comments age of colorectal polyps was in early sixties.
6. Predominance of male gender which was comparable to worldwide studies.
7. Despite high frequency of polyps among male cases, there was no statistical association with neoplastic polyps.
8. Single small polyp was the most frequent polyps in this study and it was located mostly in the left side of colon.
9. Sessile polyps constitute 2/3 of polyps in this study and pedunculated polyps were found in 1/3 of sample.

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