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THE PROFILE OF COLORECTAL ADENOCARCINOMA AT DR. M. DJAMIL GENERAL HOSPITAL PADANG, INDONESIA

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Abstract
Colorectal carcinoma is the third most common malignancy in the world. This malignancy originates from the epithelium of the colon and/or rectum, showing glandular or mucinous differentiation, where tumor cells have penetrated the muscularis mucosae layer. The study aims to report on epidemiological, clinical, and pathological characteristics of colorectal adenocarcinoma. Methods: We performed a retrospective descriptive study of 140 cases of colorectal adenocarcinoma in the gastroenterology and general surgery departments of M. Djamil General Hospital Padang, Indonesia conducted from January 2022 to December 2022. Data collection using medical records of patients in M. Djamil General Hospital Padang, Indonesia. We reported different data: Age, sex, site, and differentiation grade of the tumor. Results: Our study included 140 patients 80 males (57,1%) and 60 females (42.9%), with a median age range of 51-60 years. The tumors were found in the rectum (58.6%), distal colon (26.4%), and proximal colon (15.0%). The differentiation grade was majority low grade (83.6%). Conclusion: In conclusion, our result showed that colorectal adenocarcinoma are highest in the male population with an age range of 61-70 years. The most common site of adenocarcinoma is rectum.
Keywords: *colorectal adenocarcinoma*, anatomical location, *differentiation grade, profile*

INTRODUCTION

Colorectal adenocarcinoma is a malignancy of the epithelium of the colon and/or rectum, exhibiting glandular or mucinous differentiation, where the tumor has penetrated through the muscularis mucosae layer into the submucosal layer.[1] Global Cancer International Agency for Research on Cancer (Globocan IARC) data indicated that there were 1,849,518 instances of colorectal carcinoma in 2018. The most notable prevalence of this cancer type was observed in European nations like Hungary, Slovenia, Slovakia, the Netherlands, and Norway.[2]

The peak incidence of colorectal carcinoma occurs between the ages of 60 and 70, with less than 20% of cases occurring before the age of 50. In Indonesia, as per the 2018 Globocan data, there were 30,017 cases of colorectal carcinoma, positioning it as the fourth most prevalent cancer following breast, cervical, and lung cancers. The occurrence is more frequent in males than females, with a ratio of 1.75:1.[3]

The high incidence of colorectal carcinoma is associated with various factors. Approximately 70% of colorectal carcinoma cases are sporadic and influenced by environmental factors such as dietary patterns, physical activity, smoking, and alcohol consumption.[4] Through several studies, the biological and molecular characteristics of colon cancer associated with smoking in women have begun to emerge. They tend to have MSI-H, positive CIMP, and BRAF mutations

Nusantara Hasana Journal
Volume 4 No. 1 (Juni 2024), Page: 65-70
E-ISSN : 2798-1428

with a location in the proximal colon.[5]

The assessment of differentiation grade is determined by the proportion of glandular structures. Previously, classifications consisted of four grades: well-differentiated, moderately differentiated, poorly differentiated, and undifferentiated. Currently, the differentiation grade system is divided into two categories: low grade and high grade. These two-grade differentiation levels are recommended by the World Health Organization (WHO) and the American Joint Committee on Cancer (AJCC) because they reduce variation among examiners and enhance prognostic significance.[1,6]

Differentiation grade indicates the variance between tumors and normal tissue. Well-differentiated tumors closely resemble normal tissue in morphology and function, characterized by high maturation, low-grade malignancy, and slow progression. Conversely, poorly differentiated tumors closely resemble the morphology of parent cells and lose biological function, characterized by low maturation, high-grade malignancy, rapid progression, and earlier metastasis.[7]

This research aims to obtain the epidemiological, clinical, and pathological characteristics of colorectal adenocarcinoma patients undergoing colectomy surgery at Dr. M. Djamil General Hospital Padang in 2022 based on age, gender, tumor location, and tumor differentiation grade.

METHODS

All study subjects were patients admitted to M. Djamil General Hospital Padang, Indonesia from January 2022 to December 2022. All patients were diagnosed with colorectal adenocarcinoma and identified by histopathology. Data collection using medical records of patients in M. Djamil General Hospital Padang, Indonesia. We reported different data: Age, sex, site, and differentiation grade of the tumor. Age is classified as <41 years, 41-50 years, 51-60 years, 61-70 years, and >70 years.[8] The degree of differentiation is divided into low-grade and high-grade based on glandular structures. The criteria for low grade are when glandular structures are more than 50%, while high grade refers to glandular structures being less than 50%.[1] The anatomical locations include colon proximal (cecum, ascending colon, transverse colon, hepatic flexure, and spleen), colon distal (descending colon and sigmoid colon), or rectum (rectum and rectosigmoid junction).[9] Descriptive analysis was performed to characterize the age, sex, site, and differentiation grade.

RESULT AND DISCUSSION

The findings of the study allow for the presentation of data related to each variable. Table 1 illustrates the epidemiological features of individuals diagnosed with colorectal adenocarcinoma based on age. It indicates that the highest frequency of colorectal adenocarcinoma cases occurred in the age bracket of 61-70 years (38.5%). The age range varied from 29 to 86 years, with a mean age of 57.39 years among patients.

Table 1. The age group of the tumor

Age	Number	Percentage
≤40	11	7,8

Nusantara Hasana Journal
Volume 4 No. 1 (Juni 2024), Page: 65-70
E-ISSN : 2798-1428

41-50	37	26.4
51-60	37	26.4
61-70	43	30.7
≥71	12	8,6

The data presented in Table 2 indicates that the majority of the 140 respondents were male, constituting 80 individuals (57.1%).

Table 2. The distribution of tumors based on gender

Gender	Number	Percentage
Male	80	57.1
Female	60	42.9

The tumors were found in the rectum 82 (58.6%), colon distal 37 (26.4%), and colon proximal (15.0%). The distal locations include the descending colon and sigmoid colon, while the proximal locations include the ascending colon and transverse colon. Table 3 shows the sites of the tumor.

Table 3. Sites of the tumor

Location	Number	Percentage
Colon Proximal	21	15.0 %
Colon Distal	37	26.4 %
Rectum	82	58,6 %

The majority of colorectal adenocarcinoma patients had low-grade differentiation, comprising 117 cases (83.6%), while only 16.4% had high-grade differentiation. Table 4 shows the differentiation grade in colorectal adenocarcinoma patients.

Table 4. Differentiation grade of the tumor

Differentiation grade	Number	Percentage
Low grade	117	83.6
High grade	23	16.4

Colorectal adenocarcinoma is the most common malignancy of the digestive tract. Although colorectal cancer is one of the preventable cancers, it still represents a significant public health burden.s In this study, the patient's ages ranged from 29 to 86 years at diagnosis with a peak incidence in the 6th decade of life and male predominance (57.1%) which aligns with El-Shami et al., who stated that the incidence of colorectal cancer is higher in individuals aged 50 years and above compared to those aged 20-49 years.[10] This is in line with Globocan data, which indicates a significant increase in the incidence of colorectal carcinoma in individuals over 50 years old, with approximately 59% of the estimated 1.8 million cases worldwide occurring between the ages of 50 and 74 years.[2] The incidence of colorectal adenocarcinoma is commonly found in older age groups,

Nusantara Hasana Journal
Volume 4 No. 1 (Juni 2024), Page: 65-70
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likely due to the multifactorial pathogenesis of this cancer, dominated by lifestyle and environmental factors that trigger carcinogenesis.[11,12] This exposure requires a relatively long and continuous period of time. Small adenomas progressing to infiltrative adenocarcinoma typically take about 10 years.[11]

Globocan found that the incidence rate in males is higher than in females with a ratio of 1.47:1. The male-female disparity is likely due to differences in exposure to risk factors such as lifestyle, diet, smoking, and obesity.[12] Women are protected from the risk of colorectal carcinoma associated with estrogen and aromatase activity in converting testosterone into estrogen. The exact role of testosterone in colorectal carcinoma is still not fully understood.[13] One study reported that the number of cytosine-adenine-guanine (CAG) repeats in the androgen receptor (AR) gene is directly proportional to the risk of developing colorectal carcinoma in males. Increased CAG repeats are mostly found in MSI or p53 mutations.[14]

Regarding tumor location, 82 cancers (58.6%) were found in the rectum, accounting for the largest percentage of all cases. Similar to previous studies, the most common location of lesion are rectum followed by the sigmoid colon. Lesions in the rectum and distal colon frequently manifest symptoms compared to those in the proximal region. Symptoms such as intestinal obstruction, alterations in bowel habits, bleeding, and narrow stool caliber are commonly linked with distal colon lesions.[15]

Rectal carcinomas differ from colon carcinomas in terms of molecular subtypes, genetic markers, treatment approaches, and metastatic patterns. Rectal carcinomas exhibit molecular subtypes with varying genetic markers, such as APC, TP53, KRAS, and BRAF mutations. Treatment approaches for rectal cancer often involve neoadjuvant radiotherapy or chemoradiotherapy followed by total mesorectal excision. Metastatic patterns of rectal carcinomas differ from colon cancers, with rectal tumors showing varying mutation frequencies in genes like BRAF and EGFR pathway activation. Despite these differences, metastatic rectal and colon cancers are commonly treated as a single entity.[16]

In this study, the predominant form of tumor differentiation observed was low-grade adenocarcinoma, constituting 83.6% of cases. This finding aligns with Gunasekaran V et al.'s research, indicating a higher prevalence of low-grade differentiation compared to high-grade, at 90.9%.[9] Similar results were reported in studies conducted by Liana N. in Padang, Jayadi T. in Yogyakarta, and Anggunan in Lampung.[17–19]

Tumor differentiation grade is determined by the percentage of glandular structures formed by tumor cells. Differentiation grade uses a two-tier system: low-grade (glandular structures >50%) and high-grade (glandular structures <50%). This differentiation grade is applied to adenocarcinoma NOS, micropapillary adenocarcinoma, and serrated adenocarcinoma subtypes, as other histopathological subtypes have distinct prognoses.[1]

The degree of differentiation plays a crucial role as a prognostic factor and significantly influences survival rates. Patients with low-grade differentiation have a better 5-year survival rate. Numerous studies suggest that tumor differentiation level becomes an independent prognostic factor, particularly when utilizing a 2-tier differentiation system.[20] High-grade differentiation is linked to lymph node metastasis in more than 50% of cases, while low-grade differentiation is less

Nusantara Hasana Journal
Volume 4 No. 1 (Juni 2024), Page: 65-70
E-ISSN : 2798-1428

likely to result in lymph node metastasis. Moreover, differentiation level is also associated with the likelihood of venous vessel spread and local dissemination.[21]

CONCLUSION

In summary, our result showed that colorectal adenocarcinoma is highest in the male population with an age range of 61-70 years. The most common location of colorectal adenocarcinoma is rectum. A significant majority of patients diagnosed with colorectal adenocarcinoma through histopathological examination exhibit low-grade differentiation.

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Nusantara Hasana Journal
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