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## **EXPLORING MORPHOLOGICAL CHARACTERISTICS AND AGE DISTRIBUTION IN COLON ADENOCARCINOMA DIAGNOSIS**

### ***Introduction***

Colon adenocarcinoma refers to a malignant neoplasm arising from the glandular epithelial cells lining the colon. It represents the most common histologic type of colorectal cancer, characterized by the uncontrolled proliferation of abnormal cells within the colon's mucosal layer [1, 2].

The etiology of colon adenocarcinoma is multifactorial, involving both genetic and environmental factors. Genetic predisposition plays a significant role, with hereditary syndromes such as familial adenomatous polyposis (FAP) and Lynch syndrome (hereditary nonpolyposis colorectal cancer) contributing to a heightened risk [3].

Activating mutations in the KRAS oncogene confer growth advantages to tumor cells, facilitating their progression to invasive adenocarcinoma. TP53 gene mutations disrupt normal cell cycle regulation and DNA repair mechanisms, promoting genomic instability and malignant transformation. Inactivation of the SMAD4 tumor suppressor gene further contributes to dysregulated TGF- $\beta$  signaling, promoting tumor progression and metastasis in colon adenocarcinoma [4].

Colon adenocarcinoma, histopathologically is characterized by glandular structures infiltrating the colonic mucosa, forming irregular tubular or cribriform patterns [5].

Colon cancer is believed to arise from two types of precursor polyps via two distinct pathways: conventional adenomas by the conventional adenoma-to-carcinoma sequence and serrated adenomas according to the serrated adenoma-to-carcinoma theory. Conventional adenomas arise from mutation of the APC gene; progression to colon cancer is a multistep process. The fundamental genetic defect in serrated adenomas is unknown. Environmental factors can increase the risk for colon cancer. Advanced colon cancer often presents with symptoms, but early colon cancer and premalignant adenomatous polyps commonly are asymptomatic, rendering them difficult to detect and providing the rationale for mass screening of adults over age 50 [6].

Epidemiological data reveals significant variability in the incidence of colon carcinoma across different regions, with developed countries generally exhibiting higher rates compared to their developing counterparts. In regions like the United States and Western Europe, colon carcinoma ranks among the most frequently diagnosed cancers, witnessing notable increases in recent decades. Conversely, areas with lower socioeconomic status tend to experience lower incidence rates. Age is a critical factor, with incidence steadily rising with advancing age, notably after 50 years [7].

Treatment options for colon adenocarcinoma encompass various modalities aimed at mitigating tumor progression and improving patient outcomes. Aspirin (ASA) and other nonsteroidal anti-inflammatory drugs (NSAIDs) have shown promising results in inhibiting colorectal tumorigenesis. Apoptosis, a vital process in tissue mass regulation, holds significance in the context of carcinogenesis. While chemotherapy remains a cornerstone of treatment,

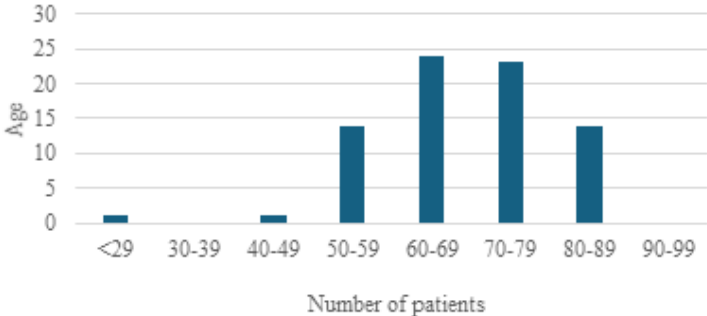
providing significant therapeutic benefits, surgical intervention stands as the primary curative approach for colon adenocarcinoma [2, 8].

**Goal**

The objective of this article is to provide a comprehensive exploration of the morphological characteristics of colon adenocarcinoma and investigate the age distribution at which it is diagnosed.

**Material and methods of research**

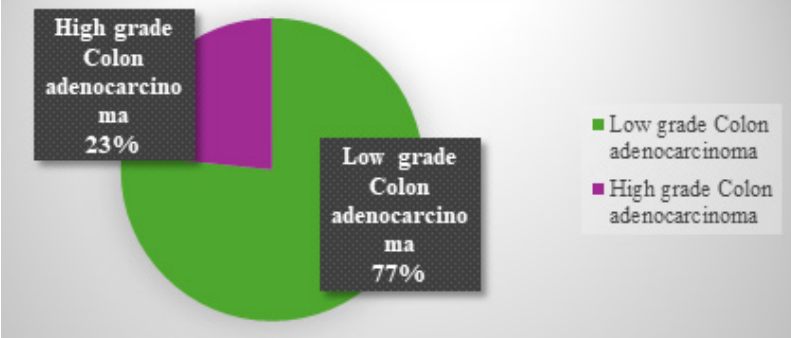
The study involved the analysis of biopsies obtained from 77 patients admitted to the Gomel Regional Clinical Hospital, presenting with pathological conditions affecting the colon. The materials utilized for examination included endoscopic biopsies and operative specimens. The results of the research revealed that among the 77 biopsies examined, 65 (84.4%) confirmed the presence of tumors, while only 12 (15.58%) were tumor-free. Specifically, 67.53% (n=52) of the cases were diagnosed as colon adenocarcinoma, 14.2% (n=11) as adenoma, and 3.87% (n=3) as other types of tumors. The remaining 14.29% (n=11) were identified as polyps, acute peritonitis, and other non-neoplastic conditions. Analysis based on patient age categories revealed varying distribution patterns. While only 1.2% (n=1) of cases fell within the age group of 29–39 and 39–48, a notably higher proportion of 15.58% (n=12) were observed in the age group of 48–58. Furthermore, the prevalence increased with advancing age, with 23.3% (n=18) in the age category of 58–67, 29.87% (n=23) in 67–77, 25.97% (n=20) in 77–86, and 2.5% (n=2) in 86–96 age groups. These findings underscore the significance of age-related trends in the occurrence of colon adenocarcinoma and other colorectal pathologies, contributing to a better understanding of disease epidemiology and patient management strategies. Figure 1 depicts the age distribution of the patients.



*Figure 1 – Age distribution*

Upon considering the spectrum of pathologies affecting the large colon region, our analysis revealed that colon adenocarcinoma emerged as the predominant pathological entity.

Figure 2 depicts the percentage of patients with different grades of severity of adenocarcinomas.



*Figure 2 – Percentage of patients with different grades of severity of adenocarcinomas*

Among the 77 cases examined, a staggering 59 individuals were diagnosed with colon adenocarcinoma (table 2), representing a substantial proportion of 77% within the collected dataset. This notable prevalence underscores the paramount significance of colon adenocarcinoma as the primary pathological condition affecting patients presenting with colon-related pathologies.

### **Conclusions**

The findings of the study highlight a notable prevalence of colon adenocarcinoma among patients within the age group of 67–77 years. Conversely, it is observed that individuals in younger age groups are rarely affected by this condition. This age-related distribution underscores a significant association between advancing age and the incidence of colon adenocarcinoma, with older individuals being more susceptible to the disease.

### **LITERATURE**

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