

Original research article

A STUDY OF COLORECTAL CANCER IN YOUNG INDIVIDUALS

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Abstract

Colorectal cancer ranks as the third most prevalent form of cancer and can be identified at an early stage through the utilisation of cancer screening. Consequently, there has been a reduction in the occurrence of illness and death associated to colorectal cancer in older individuals. Nevertheless, there has been a rise in the prevalence of this malignancy in young individuals. This study was conducted to examine the attributes of young individuals diagnosed with colorectal cancer.

Keywords: Colorectal cancer, genetics, young individuals

Introduction

With 1.3 million cases occurring each year, colorectal cancer (CRC) ranks as the third most prevalent disease in males and the second most prevalent cancer in females ^[1]. Incidence and patterns of the condition vary significantly across different geographic, racial, and ethnic groups, with 55% of cases being reported in high-resource nations. Colon cancer is more prevalent than rectal cancer (RC) in developed countries, and it typically occurs after the age of 50 ^[2]. A recent review of End Results data for 393,241 individuals with CRC examined between 1975 and 2010 revealed a consistent decline in both the occurrence and death rates of this disease in the United States ^[3]. Nevertheless, there was a rising trend in the occurrence among younger persons, with a notable dominance of rectal cases. During a separate examination conducted between 1984 and 2005, the prevalence of RC rose by 3.8% year among individuals under the age of 40 ^[4]. Data from the United States indicates that around 11% of colon cancers and 18% of rectal cancers (RCs) are diagnosed in individuals under the age of 50 ^[4]. These tumours are more prone to being poorly differentiated, exhibiting mucinous and signet ring characteristics, and being in advanced stages of illness. Approximately 20% of these occurrences can be attributed to familial disorders. The potential causes for this concerning pattern are hypothesised to include insufficient screening in young adults and lifestyle variables such as obesity, sedentary behaviour, a diet high in processed foods and red meat, and a low consumption of fruits and vegetables ^[3]. This study was

conducted to examine the attributes of young patients diagnosed with colorectal cancer.

Methods and Materials

This study involved patients with colorectal cancer who were confirmed through histological examination. The patients were under the age of 50 and were receiving treatment at the Department of Oncology from 2022 to 2023. Data on the demographic characteristics of patients, as well as information on colorectal cancer, was gathered. The data was inputted into an MS Excel worksheet and evaluated utilising descriptive statistics. All patients provided informed consent.

Results

Table 1: Age Range

Total	Mean age	Range
31	41.74 years	26-49

Table 2: Stage of the disease

Stage 1	03
Stage IIA	03
Stage IIIA	02
Stage IIIB	11
Stage IIIC	07
Stage IVA	05

Table 3: Site

Rectum	19
Ascending Colon	07
Descending including sigmoid	04

Table 4: Chemotherapy

Chemotherapy	
mFOLFOX6	26
CapeOx	17
FOLFIRI	5
mFOLFOX + bevacizumab	4

Table 5: Radiotherapy and surgical intervention

Radiotherapy	21
Surgical intervention	09

Discussion

India had significantly lower incidence rates of colorectal cancer (CRC) compared to developed countries, with rates of 4.2 and 3.2 per 100,000 in males and females, respectively. In contrast, developed countries had incidence rates ranging from 25 to 44 per 100,000 ^[1, 5]. Australia and New Zealand have reported the highest estimated rates, with age-adjusted rates of 44.8 and 32.2 per 100,000 in males and females respectively. The conventional Indian diet, primarily composed of plant-based foods high in fibre and spices abundant in antioxidants, is believed to have a preventive effect on colorectal cancers ^[6]. Recent data, however, suggest a consistent rise in the occurrence of colorectal cancer in India. This is likely due to the rising urbanisation and changes in lifestyles and dietary habits ^[7]. These factors are insufficient to fully account for the notable disparities observed in the clinicopathologic characteristics of colorectal cancers (CRCs) in India as compared to those in Western countries. The main distinctions include a much younger median age of occurrence and a higher prevalence in the rectum ^[8, 9]. This study demonstrated a higher occurrence of colon cancer on the left side (50%) compared to rectal cancer (39%), which is different from earlier studies conducted in India where rectal cancer was more common ^[8, 9]. The majority of individuals (78%) adhered to a non-vegetarian diet when examining their dietary habits. Cancer had an equal distribution amongst males and females. 85% of male patients had a history of smoking, whereas 64% had a history of alcohol usage. None of the female patients had a prior history of smoking or alcohol usage, however, 14% of female patients were found to have engaged in tobacco consumption. While tobacco, alcohol, and HPV have been widely studied as potential causes, there has been limited focus on other factors such as occupational exposures, environmental and industrial pollutants and other risk factors that have emerged alongside the increasing incidence of these cancers. The range of numbers from 10 to 13.

Significant progress has been made in understanding the molecular processes that contribute to the development of colorectal cancer (CRC) in the Western world. This includes a deeper understanding of the genetic and epigenetic factors involved. It is currently acknowledged that there are at least three primary routes that result in the development of colorectal cancer: the chromosomal instability pathway (CIN), the microsatellite instability pathway (MSI) and the cytosine-phosphate-guanine island methylator phenotype pathway (CIMP). The coordinates are ^[14, 15]. Colorectal intraepithelial neoplasia (CIN) is responsible for roughly 70% to 85% of all sporadic colorectal cancers (CRCs) in the Western population. These tumours typically occur in a region that is far from the origin and are linked to worse results, regardless of the stage ^[15]. Microsatellite instability (MSI) arises due to point mutations in genes involved in mismatch repair and it is observed in around 15%-20% of sporadic colorectal cancers (CRCs). The tumours are typically found around the origin of a structure, have a type of tissue that produces mucus, show low levels of specialisation, and have a high concentration of lymphocytes. CIMP, the third most often occurring

event, is distinguished by extensive methylation of cytosine-phosphate-guanine islands found in suppressor promoters. Intermittent MSI tumours typically exhibit CIMP-positive characteristics and are primarily found in the proximal colon, accounting for around 40% of cases. Activating mutations in the BRAF gene are found nearly exclusively in colorectal cancer (CRC) cases that are positive for microsatellite instability (MSI) and CpG island methylator phenotype (CIMP). CIMP-low tumours frequently exhibit mutations in the KRAS gene ^[15]. The increasing size and hostile nature of these tumours necessitate a thorough investigation into possible risk factors, such as water and air pollution, implementation of preventive measures, and the establishment of screening initiatives. This study is constrained by a small sample size and the absence of genetic testing. Additional research is required to investigate the genetic composition of these tumours.

Conclusion

The prevalence of colorectal cancer in young individuals is increasing. The cause for this rise is uncertain, and the proportionate influences of genetic vs environmental factors remain relatively un-investigated.

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