

# Colorectal cancer among Yemeni patients

## Characteristics and trends

Huda O. Basaleem, MD, MS, Khaled A. Al-Sakkaf, MD, MS.

---

### ABSTRACT

**Objective:** This study aimed to describe the characteristics and trends of colorectal cancer registered in Aden Cancer Registry.

**Methods:** A retrospective analysis of all registered cancers (1735) was performed at Aden Cancer Center, University of Aden, Aden, Yemen from the years 1997-2001, to describe colorectal cancers with regards to age, sex and residency distribution, subsites and histopathology, and incidence rates.

**Results:** The results indicate that digestive system cancers are the most common cancers (17.1%); and

colorectal cancer (28%) is the most common of these. Developing countries characteristics of this cancer are clear. These include a relatively high proportion of early-onset tumor (19.3% of cases were <40 years), and left sided subsite distribution (49.4% of cases were in the rectum and rectosigmoid junction).

**Conclusion:** Further analytical studies, to address the community-related risk factors, public education, and screening programs for colorectal cancer are mandatory.

Saudi Med J 2004; Vol. 25 (8): 1002-1005

---

Colorectal cancer (CRC) is an important public health problem. There are nearly one million new cases diagnosed worldwide each year and approximately half a million death,<sup>1</sup> making this cancer the fourth most common incident cancer and cause of death throughout the world, with a risk of occurrence of one out of every 20 individuals. The developed countries account for >63% of the total global incidence. High-risk areas include North America, Europe, and Australia. Central and South America, Africa and Asia are areas with low risk factors.<sup>2</sup> There are many risk factors for CRC, some of which are not amenable to change. These include older person (>50 years), male sex, inflammatory bowel diseases, certain hereditary conditions and a family history of CRC or

adenomatous polyps.<sup>3</sup> A great concern is recently paid for genetic factors,<sup>4</sup> in addition to the role of environmental factors. These factors include low physical activity,<sup>5</sup> infection,<sup>6-8</sup> tobacco,<sup>9</sup> hyperinsulinemia associated with type II diabetes mellitus,<sup>10</sup> and dietary factors.<sup>2</sup> Research is ongoing on the role of dietary factors such as red meat especially overcooked or processed, high fat intake, obesity, and alcohol consumption.<sup>2</sup> In addition, the protective role of non-steroidal anti-inflammatory drugs,<sup>11</sup> estrogen postmenopausal therapy,<sup>12</sup> and some dietary factors,<sup>13</sup> are also recently evaluated. However, 75% of all CRC occur in people with no known predisposing factors for the disease. This makes early detection and management with different screening modalities is an important mean

---

From the Department of Community Medicine and Public Health (Basaleem), Aden Cancer Center, Faculty of Medicine and Health Sciences, University of Aden and the Department of Community Health (Al-Sakkaf), Dr. Amin Nasher Higher Institute of Health Sciences, Aden, Yemen.

Received 27th January 2004. Accepted for publication in final form 20th March 2004.

Address correspondence and reprint request to: Dr. Huda O. Basaleem, Head of Tumor Registry, Aden Cancer Center, Faculty of Medicine and Health Sciences, University of Aden, PO Box 6336, Khormaksar, Aden, Yemen. Tel. +967 (2) 240333/230734. Fax. +967 (2) 347127/232212. E-mail: hudabasaleem92@hotmail.com

for significant reduction in CRC incidence and mortality.<sup>3</sup> Currently, it is estimated that screening of the average risk people over the age of 50 would reduce mortality for CRC by 50%.<sup>14</sup> In Yemen, data regarding this cancer are scarce. Therefore, this study is undertaken to highlight the characteristics and trend of this cancer through analyzing the data registered in Aden Cancer Registry (ACR) during 5 years period.

**Methods.** A retrospective analysis for all registered cancers (1735 cases) in ACR from January 1997 to December 2001 were performed, looking for CRC with regards to age, sex and residency distribution, subsites and histopathological diagnosis, and the incidence rate. The International Classification of Diseases (ICD-10) and International Classification of Diseases on Oncology (ICD-O) were used for coding of the neoplasia. The Canreg-3 program for cancer registry (International Agency for Research in Cancer, Lyon, France) and Epi-Info software were used for the analysis of data. Validation checks of the entered data were carried out by Canreg-3 on each data item to avoid duplication and to ensure that no invalid codes are fed into the database. Colorectal cancer is a population-based cancer registry, which covers 4 governorates: Aden (the economic and commercial capital of Yemen) and adjacent 3 governorates (Lahej, Al-Dhalee, Abyan) in the Southeastern Region of Yemen with a total population of 2,017,580 inhabitants. The main sources of data are the main hospitals, the pathology and hematology laboratories, x-ray diagnostic centers, and the registry for abroad treatment. The world standard population and the local population were used for the calculation of incidence rate.

**Results.** One thousand seven hundred and thirty-five cases were registered during the 5 years study. Digestive system cancers accounted for 296 cases (17.1%) where the first ranking cancer among the registered cases. Among them, CRC (ICD-O 18:0-20:9) is the leading cancer (83 cases, 28%) as shown in **Table 1**. **Table 2** shows almost equal distribution of CRC between colon (42 cases) and rectum (41 cases) with almost equal age-standardized incidence rate (ASR) of 1.5/100,000 inhabitants for colon and 1.6/100,000 for rectum. By gender, 45 cases were males (54.2%) compared to 38 females (45.8%). The 42 colon cancer cases distributed almost equally between males and females (20 males and 22 females), whereas rectal cancer (41 cases) encountered more among males (25 cases) compared to females (16 cases). As a result of these findings, the male to female incidence rate ratio (RR) for colon cancer was 1.1:1 whereas the rectal cancer was 2.2:1. For

Table 1 - Subsites of digestive system cancers (Aden Registry Center, Aden, Yemen, 1997-2001).

Subsites	n (%)
Colorectal cancer	83 (28)
Stomach	68 (23)
Esophagus	56 (18.9)
Liver	54 (18.2)
Pancreas	20 (6.8)
Gallbladder	6 (2)
Small intestine	5 (1.7)
Other and non specified site	4 (1.4)
<b>Total</b>	<b>296 (100)</b>

Table 2 - Age-standardized incidence rate (ASR) per 100,000 and the male to female incidence rate ratios (RR) for colorectal cancer (Aden Registry Center, Aden, Yemen, 1997-2001).

Site	Male		Female		RR
	n (%)	ASR	n (%)	ASR	
Colon (n=42)	20 (47.6)	0.8	22 (52.4)	0.7	1.1:1
Rectum (n=41)	25 (61)	1.1	16 (39)	0.5	2.2:1
All colorectal cancer (n=83)	45 (54.2)	1.9	38 (45.8)	1.2	1.6:1

Table 3 - Age and residency distribution of colorectal cancer (N=83) (Aden Registry Center, Aden, Yemen, 1997-2001).

Characteristics	n (%)
<b>Age (years)</b>	
<40	16 (19.3)
40-49	9 (10.8)
50-59	29 (35)
60-69	22 (26.5)
≥70	7 (8.4)
<b>Residency</b>	
Aden	41 (49.4)
Lahej	7 (8.4)
Al-Dhalee	6 (7.2)
Hadramout	6 (7.2)
Abyan	5 (6)
Others*	18 (21.7)
*Not otherwise specified.	

Table 4 - Characteristics of colorectal cancer (N=83) (Aden Registry Center, Aden, Yemen, 1997-2001).

Characteristics	n	(%)
<b>Subsites</b>		
Rectum and rectosigmoid	41	(49.4)
Colon*	26	(31.3)
Cecum, ascending colon	9	(10.8)
Sigmoid colon	6	(7.2)
Transverse	1	(1.2)
<b>Histopathological diagnosis</b>		
Carcinoma*	39	(47)
Adenocarcinoma	38	(45.8)
Squamous cell carcinoma	3	(3.6)
Others	3	(3.6)

\*Not otherwise specified.

all CRC it was 1.6:1. The median age of males was higher than females (57.5 compared to 50.5 years). However, the age range was much wider among females (14-75 years) compared to males (30-80 years). In **Table 3**, the peak age of incidence was 50-<60 years (35% of cases) with 19.3% of cases <40 years and 30.1% <50 years. As regards to residency, half of the cases (49.4%) was from Aden (**Table 3**), whereas in 21.7% of cases, the residency was not specified and the remaining cases distributed among nearby governorates. The characteristics of CRC are demonstrated in **Table 4**. Regarding the anatomic subsites of CRC, 31.3% were not specified as to subsites. The distribution of cancer across the remaining subsites revealed rectal and rectosigmoid area preponderance (49.4%) with transverse colon as the least involved subsite (1.2%). For histopathological diagnosis, 47% of cases not specifically stated, and 45.8% were stated as adenocarcinoma. The age-specific incidence rate (ARI) for CRC for males and females was slow and parallel up to the age of 45-<55 years. At 55-<65 years, both sexes showed their peak incidence, which is much higher among males compared to females (26.6/100,000 versus 10.5/100,000 inhabitants) (**Figure 1**).

**Discussion.** In spite of the presence of effective screening modalities, CRC is still an important cause of cancer-related morbidity and mortality whose risk is now increasing even in previously low risk areas.<sup>2</sup> The World Health Organization (WHO) foresees the overall global situation in respect to CRC will be worsen.<sup>15</sup> The socioeconomic changes and urbanization, which take place in the Yemeni society, entails characterization of this cancer, which is usually

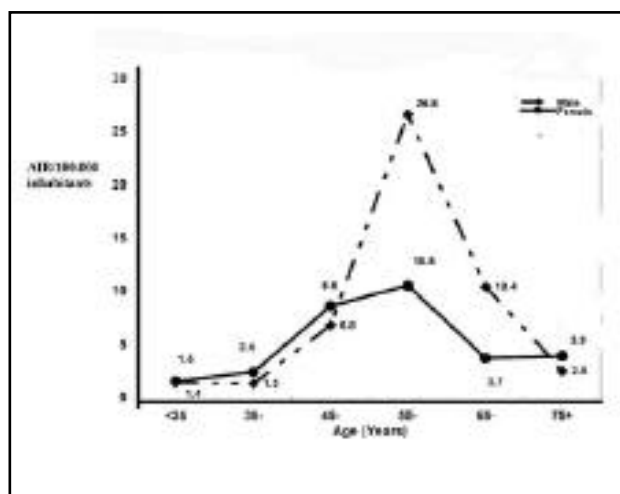


Figure 1 - Age-specific incidence rate (AIR) for colorectal cancer.

linked with economic development. As our study limited to registered data in ACR, many difficulties are faced in the interpretation of the results due to undetailed history and histopathological diagnosis and staging of the neoplasia. As a result of this, our study indicated that only 48.5% registered as adenocarcinoma, in contrast to what accepted globally that, up to 98% of CRC are adenocarcinoma.<sup>2</sup> This would not reflect the real situation of this cancer in the community. However, our results will overview the characteristics of this cancer in the area covered by the registry. The study demonstrated that CRC is the most common cancer in the digestive system. This is similar to what reported in the study of the western region of Saudi Arabia,<sup>16</sup> and Jordan.<sup>17</sup> In developed countries, CRC is not only the most common digestive system cancer, but also a leading cancer either the third or the second cancer behind lung cancer in male and breast cancer among females.<sup>18</sup> Our results are in accordance with the literature regarding the occurrence of high number of cases among males.<sup>2,3</sup> It was reported that CRC has a different sex distribution with nearly similar incidence between the sexes for colon and a male preponderance for rectal cancer.<sup>2</sup> This is almost the same trend encountered with male to female incident RR for colon cancer and for rectal cancer. Another important features highlighted by the study is the resemblance of our data with those from developing countries regarding the early age of onset of cancer and left side subsites preponderance,<sup>19-23</sup> compared to late age at diagnosis and right side (proximal shift) in developed countries.<sup>24</sup> Early age of incidence is a characteristic in developing countries. Under age of 40, there are more than one-third of cases in Egypt,<sup>20</sup> 21.4% in Saudi Arabia,<sup>25</sup> and 17%

in Philippine,<sup>23</sup> compared to 3.6% in USA,<sup>26</sup> and 7.6% in Canada.<sup>27</sup> Studies from Egypt proposed that the high incidence of cancer in young people could not be explained on a hereditary basis nor can it be attributed to bilharziasis,<sup>20</sup> or the widespread use of pesticides especially organochlorine.<sup>28</sup> In our community, bilharziasis, farming and pesticide use are common, and further analytical studies could delineate its role together with other risk factors for CRC. In the present study, despite a large percentage of non-specified cancer subsites (31.3%), left side preponderance is clear as 49.4% of cases are in the rectum and rectosigmoid junction, in addition to 7.2% of sigmoid cancer. The proximal shift in developed countries is not clearly discussed in literature, although some relate it to possibly more effective screening in the right side, or to real reduction in rectal cancer incidence.<sup>24</sup>

In conclusion, the study demonstrated that CRC is the leading digestive system cancer. Despite limitations in the background history, detailed histopathological diagnosis and staging, the study indicated that developing countries characteristics as the presence of relatively high proportion of early-onset tumor and left-subsided preponderance are clear. Therefore, we recommend further in-depth studies, to address the possible community-related risk factors of this cancer, education of the public about the nature of the disease, execution of screening programs for early detection and better outcome, detailed histopathological diagnosis and staging and improvement of cancer-reporting and registering activities.

## References

1. Boyel P, Leon ME. Epidemiology of colorectal cancer. *Br Med Bull* 2002; 64: 1-25.
2. The World Cancer Research Fund. The American Institute for Cancer Research. Food, Nutrition and the Prevention of Cancer: a global perspective. The World Cancer Research Fund and the American Institute for Cancer Research. Washington (DC): Banta Book Group; 1997.
3. Agency for Health Care Policy and Research (AHCRR). Colorectal cancer screening: Executive Summary. Silver Spring: AHCRR Publication Clearinghouse: Publication No. 97-0302: 2002.
4. Wang Y, Friedle W, Lamberti C, Jungck M, Mathiak M, Pangers P, et al. Hereditary non-polyposis colorectal cancer: frequent occurrence of large genomic deletion in MSH2 and MLH1 genes injury. *Int J Cancer* 2003; 103: 636-641.
5. Fridenriech CM, Orenstein MR. Physical activity and cancer prevention: etiological evidence and biological mechanism. *J Nutr* 2002; 132 (11 Suppl): 345-364.
6. Harkins L, Volk AL, Samanta M, Mikolaenko I, Britt WJ, Bland KI, et al. Specific localization of human cytomegalovirus nucleic acid and protein in human colorectal cancer. *Lancet* 2002; 360: 1557-1563.
7. Enam S, Del Valle L, Lara C, Gan DD, Ortiz-Hidalgo C, Palazzo JP, et al. Association of human polyoma virus JCV with colon cancer: evidence for interaction of viral t-antigen and beta catenine. *Cancer Res* 2002; 62: 7093-7101.
8. Hartwich A, Konturek SJ, Pierzchalski P, Zuchowicz M, Labza H, Konturek PC, et al. *Helicobacter pylori* infection, gastrin, cyclooxygenase-2 and apoptosis in colorectal cancer. *Int J Colorectal Dis* 2001; 16: 202-210.
9. Kuper A, Boffetta P, Adami HO. Tobacco use and cancer causation: association by tumor type. *J Intern Med* 2002; 252: 206-224.
10. Gupta K, Krishnaswamy G, Karnad A, Peiris AN. Insulin: a novel factor in carcinogenesis. *Am J Med Sci* 2002; 323: 140-145.
11. Martin C, Connelly A, Keku TO, Mountcasite SB, Galanko J, Woosley JT, et al. Nonsteroidal anti-inflammatory drugs, apoptosis and colorectal adenomas. *Gastroenterol* 2002; 123: 1770-1777.
12. Dilleo A, Messa C, Carallini A, Linsalala M. Estrogen and colorectal cancer. *Curr Drug Targets Immune Endocr Metabol Disord* 2001; 1: 1-12.
13. Young GP, Kle Leu R. Preventing cancer: dietary lifestyle or clinical intervention. *Asia Pac J Clin Nutr* 2002; 11 (Suppl 3): 618-631.
14. Trowbridge B, Burt RW. Colorectal cancer screening. *Surg Clin North Am* 2002; 82: 943-932.
15. World Health Organization. The World Health Report 1998. Life in the 21st century. A vision for all. Geneva: WHO: 1998.
16. Al-Radi AO, Ayyub M, Al-Mashat FM, Barlas SM, Al-Hamdan NA, Ajarum DS, et al. Primary gastrointestinal cancer in the western region of Saudi Arabia: Is the pattern changing? *Saudi Med J* 2000; 21: 730-734.
17. Al-Jabri TM, Ammari F, Gharieyeh K, Khammash M, Yagham RJ, Heis H, et al. Colorectal adenoma in a defined Jordanian population from 1990 to 1995. *Dis Colon Rectum* 1997; 40: 1089-1094.
18. Hawk ET, Limburg PJ, Viner JL. Epidemiology and prevention of colorectal cancer. *Surg Clin North Am* 2002; 82: 905-941.
19. Abdel-Rahman SZ, Soliman AS, Bondy ML, Omar S, El-Badwey SA. Inheritance of the 194 Trp and the 399Gln variants alleles of the DNA repair gene XRCC1 are associated with increased risk of early-onset colorectal cancer in Egypt. *Cancer Lett* 2000; 159: 79-86.
20. Abu-Zaid AA, Khfagy W, Marzoul OM, Alaa A, Mostafa I. Colorectal cancer in Egypt. *Dis Colon Rectum* 2002; 45: 1255-1260.
21. Kim DW, Bang YJ, Heo DS, Kim NK. Colorectal cancer in Korea: characteristics and trends. *Tumori* 2002; 88: 262-265.
22. Ayyub MI, Al-Zadi AO, Khazindar AM, Nagi AH, Massiyar IA. Clinicopathological trends in colorectal cancer in tertiary care hospitals. *Saudi Med J* 2002; 23: 160-163.
23. Kaw LL, Punzalan CK, Crisostomo AC, Bowyer MW, Wharry DC. Surgical pathology of colorectal cancer in Filipinos: implications for clinical practice. *J Am Coll Surg* 2002; 195: 188-195.
24. Takada H, Ohsawa T, Iwamoto S, Yoshida R, Nakaro M, Imadokuomo M, et al. Changing site distribution of colorectal cancer in Japan. *Dis Colon Rectum* 2002; 45: 1244-1254.
25. Mansour I, Zahrani IH, Abdul-Aziz S. Colorectal cancer in Saudi Arabia. *Saudi Med J* 2002; 23: 322-327.
26. Keswani SG, Boyle MJ, Maramll JP, Mains L, Wilk SM, Hunt JP. Colorectal cancer in patients younger than 40 years of age. *Am Surg* 2002; 68: 871-876.
27. Holowaty EJ, Marrett CD, Parkes R, Fehringer G. Colorectal cancer in Ontario 1971-1996: subsites and morphology. Surveillance unit, division of preventive oncology, cancer care Ontario. Ontario (Canada): Cancer Care Ontario; 1998.
28. Soliman AS, Smith MA, Cooper SP, Ismail K, Khaled H, Ismail S, et al. Serum organochlorine pesticides level in patients with colorectal cancer in Egypt. *Arch Environ Health* 1997; 52: 409-415.