

# Assessment of Prevalence and Haematological Parameters of Colorectal Cancer Patients at a Tertiary Care Hospital, Al Ahsa, Kingdom of Saudi Arabia

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## ABSTRACT

**Objective:** To assess the prevalence and haematological parameters of colorectal cancer (CRC) patients at King Fahd Hospital (KFH) Al Ahsa, Kingdom of Saudi Arabia (KSA).

**Study Design:** Observational / analytic study.

**Place and Duration of Study:** This study was conducted at King Fahd Hospital (KFH), Al Ahsa, Kingdom of Saudi Arabia (KSA) from January 2015 to December 2015.

**Materials and Methods:** The study was conducted among cancer patients, visited KFH, Al Ahsa. Total 200 cancer patients, consisting of 110 males and 90 females of age 46-80 years, were included. The medical records of the patients, suffering from various cancers, i.e., colorectal, breast, lung, blood and thyroid, etc., were retrieved from KFH, and the patients who were diagnosed to have CRC were assessed for the prevalence & the haematological parameters. The data were analysed using SPSS 16.

**Results:** Prevalence of CRC: Among total 200 cancer patients, 49 (24.5%) males of age 46 – 80 (median 63) years, and 13 (6.5%) females of age 48 – 72 (median 60) years were found to have CRC.

Hematological parameters of CRC patients: In both genders, majority (~80%) of the patients had Hb level ~10g/dl. The type of anaemia was iron deficiency anaemia. The ESR was found to be raised (~45mm/hour) in both genders. The WBC and platelet counts were in normal range.

**Conclusion:** We found significant prevalence (31%) of CRC among various cancer patients. Two haematological parameters, i.e., Hb and ESR were significantly disturbed in these CRC patients. The Hb and ESR parameters are inexpensive investigations, which are very important indicative of CRC disease and its prognosis.

**Key Words:** Colorectal cancer, prevalence, haematological parameters, anaemia

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## INTRODUCTION

Colorectal cancer (CRC) is the most common cancer among adult males and the second most common cancer among adult females in Saudi Arabia as per the report of 2012<sup>1</sup>, and the second & the third most common cancer among females & males, respectively, worldwide<sup>2</sup>. The survival after the diagnosis is estimated to be around five years. In comparison to the other countries worldwide, Kingdom of Saudi Arabia (KSA) is considered to have a low incidence of CRC, but within the kingdom itself, this disease ranks the second number after the breast cancer<sup>3</sup>.

The differences in the prevalence of CRC worldwide are explained by different dietary and the environmental factors<sup>4</sup>, which are supported by the evidence of the studies of migrants, moving from low risk to high risk areas<sup>5,6</sup>. The increased risk of CRC was reported in the people, who consumed the diet, poor in fiber, such as meat<sup>7</sup> and fat<sup>8</sup>. It has also been shown that increased body-weight and lack of physical activity are the major risk factors for the development of CRC<sup>9-12</sup>. The other non-dietary causes of CRC include genetic predisposition<sup>13</sup>, Crohn's disease and ulcerative colitis<sup>14</sup>. In previous reports, an association between the anaemia and CRC was shown where the CRC patients presented with the anaemic features as their presenting complaint and later diagnosed to have CRC<sup>15</sup>. Another study showed that the main presenting feature of these patients was microcytic hypochromic (Iron deficiency) anaemia, which was also found to be the major prognostic predictor of these patients<sup>16-20</sup>. Several studies have been conducted on the hemoglobin level of CRC patients before the start of the treatment<sup>21</sup>, however no updated data have been published in our region Al Ahsa on the prevalence of CRC and the changes in their haematological parameters, including

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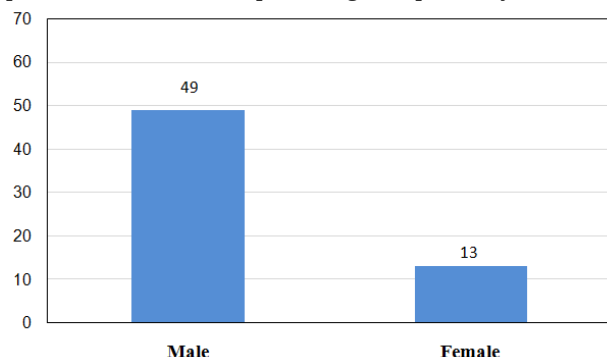
Hb & ESR levels, and WBC & platelet counts during the time of the diagnosis and before the start of the treatment. The information on the haematological parameters in these patients is very important to improve the physical health by adding the adjuvant treatment. In our current study, we analysed the prevalence of CRC patients and assessed their haematological parameters, which will provide with the important information to prevent the development of CRC and to add the adjuvant therapy to CRC patients to improve their health and increase their life expectancy.

## MATERIALS AND METHODS

Total 200 patients (both males and females), suffering from various cancers, i.e., colorectal, breast, lung, blood, thyroid, and bone, etc., were included in the study. The age of the patients ranged from 46- 80 years. Medical records of these patients were retrieved from KFH, Al Ahsa. The patients, who were diagnosed through histopathological reports to have CRC, were analysed for their prevalence. Furthermore, their haematological parameters were assessed for any changes. The study was conducted retrospectively from January 2105 to December 2015. The data were analysed by using SPSS 16.

## RESULTS

**Prevalence of CRC:** Among total 200 cancer patients, 62 (31%) had CRC, amongst which 49 (24.5%) were males of age 46 – 80 (median 63) years, and 13 (6.5%) were females of age 48 – 72 (median age 60 years). Figure 1 and figure 2 describe the prevalence of CRC patients in number and percentage, respectively.



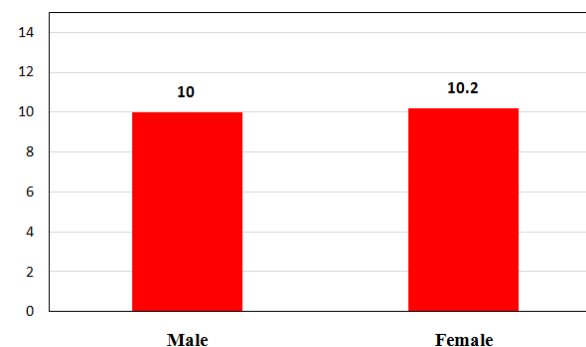
**Figure No.1: Prevalence (in number) of CRC patients. Out of total 200 cancer patients, 49 males and 13 females had CRC.**

**Assessment of haematological parameters in CRC patients:** Pretreatment haematological parameters were assessed for Hb & ESR levels, and WBC & platelet counts. In male patients, the Hb level ranged from 4 to 13g/dl (normal 13-18g/dl), while in females from 9 to 14g/dl (normal 12-16g/dl). In both genders, majority (80%) of the patients had Hb level ~10g/dl (figure 3). The type of anaemia was iron deficiency anaemia. The

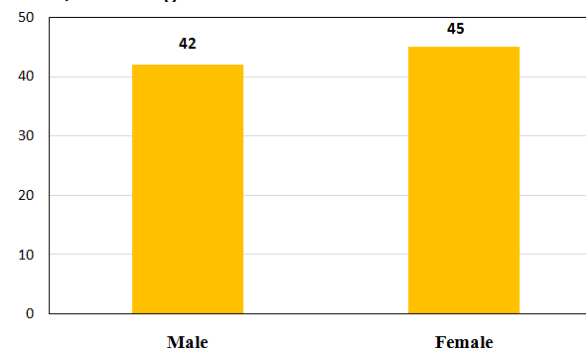
ESR was found to be ~45mm/hour in both genders (normal <20mm/hour) (figure 4). Total WBC count in both genders was found to be  $3.7 - 11.7 \times 10^3/\text{mm}^3$  (normal  $4 - 11 \times 10^3/\text{mm}^3$ ). Platelet count was found to be  $120 - 300 \times 10^3/\text{mm}^3$  (normal  $150 - 450 \times 10^3/\text{mm}^3$ ). The normal laboratory values for these parameters have been previously described<sup>22</sup>.



**Figure No.2: Prevalence (in percentage) of CRC patients. Among total 200 cancer patients, male CRC patients constituted 24.5% and females 6.5%.**



**Figure No.3: Haemoglobin level of CRC patients. 10g/dl in males, and 10.2g/dl in females.**



**Figure No.4: ESR level of CRC patients. 42mm/hour in one hour in males, and 45mm/hour in females.**

## DISCUSSION

In the current study, we determined the prevalence of colorectal cancer (CRC) among various cancer patients and assessed their haematological parameters. In first part of the discussion, we discuss on the prevalence of CRC. We found significant percentage of CRC (31%) among various cancer patients. Taking all the cancer

patients together, CRC was found to be the most common (number one) in males and the second most common (number two) in females after the breast cancer, which clearly indicates the high prevalence of this disease in our region Al Ahsa. There has been very scarce data on the prevalence of this disease throughout the KSA. Our study correlates to some extent with another study of Saudi Cancer Registry (2004 to 2010), Riyadh, KSA in the regard that the prevalence of CRC in males was also found to be number one (the most common), but number third among females, where number 1 and 2 cancers were breast and thyroid cancers, respectively. The median age at presentation of CRC was reported to be 60 years in males and 55 years in females, respectively<sup>23</sup>. Another study in KSA, conducted in 2003, also reported the prevalence of CRC in males to be the most common, but number third in females<sup>24</sup>. As per the study, conducted in KSA in 2012, CRC was found to be the most common cancer among adult males and the second most common cancer (after breast cancer) among adult females<sup>1</sup>. This indicates that CRC is on rise not only in males, but also getting more common in females, where it stands the second most common cancer after the breast cancer in our region. On the basis of age, CRC was found to be most common at the median age of 63 years in males and 60 years in females at the time of presentation in our current study. Our results are slightly different from another study of Riyadh province, where the median age at the presentation of CRC was reported to be 60 years for males and 55 years for females<sup>23</sup>. In contrast to this, another study in Riyadh showed the higher incidence of CRC in middle age people, where the median age of male patients was reported to be 46 years and for female 41 years<sup>24</sup>. These variations might be due to differences in environmental factors and mainly the dietary habits, as Riyadh is a big and busy city where the majority of the people, regardless of the age, eat junk and fiber-free food in the restaurants. The dietary and the environmental factors have already been shown as the risk factors for the development of CRC<sup>4-6</sup>.

In the second part of discussion, we discuss on various haematological parameters, including hemoglobin (Hb) & ESR levels, and WBC & platelet counts of CRC patients. In our study, we found two haematological parameters, the Hb and the ESR, which were disturbed in both genders. In majority (~ 80%) of CRC patients, Hb level was found to be around 10g/dl. The type of anaemia which was found was iron deficiency anaemia. Our results correlate with a study, conducted in Riyadh, which showed iron deficiency anaemia (IDA) in majority of the CRC patients<sup>25</sup>. A study in China showed decreased survival of CRC patients who had IDA<sup>26</sup>. It was already shown that cancer patients presenting with anaemia as their presenting feature had worse prognosis and increased mortality<sup>27,28</sup>. A study in

United Kingdom confirmed strong association between IDA and colorectal cancer by showing increased risk of colorectal cancer as the haemoglobin falls<sup>29</sup>. In our study, we also found moderately raised ESR in all CRC patients. It has been shown that the ESR often increases in malignant diseases<sup>30</sup>. Another study showed high ESR correlates with the worse prognosis of CRC patients<sup>31</sup>. The other haematological parameters, i.e., WBC and platelet counts were not significantly disturbed in these patients, which indicate a good prognostic factor, as two different studies already showed the worse prognosis of CRC patients who had increased platelet<sup>32</sup> and WBC counts<sup>33</sup>.

Since in our study we analysed these parameters in CRC patients at the time of their diagnosis and before the start of treatment, further follow up of these patients, before and after the start of cancer treatment and iron supplements, etc. would provide more data on the association between these parameters and CRC prognosis.

## CONCLUSION

We found significant prevalence (31%) of CRC among various cancer patients. Two haematological parameters, i.e., Hb and ESR were significantly disturbed in these CRC patients. The Hb and ESR parameters are inexpensive investigations, which are very important indicative of CRC disease and its prognosis.

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**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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