DOI Number: 10.37506/v20/i1/2020/mlu/194657

Colorectal Cancer in Nineveh: Five Years Survival Rate

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Abstract

Overall**,** colorectal cancer ranks third in terms of incidence but second in terms of mortality, according to the latest GLOBOCAN worldwide estimation in 2018**.** The aim of this study is to show the survival rates of colorectal cancer patients in Nineveh province for the period 2010 – 2014, a retrospective cohort study, conducted among patients at the Mosul Cancer Registry center. Survival analysis was carried out using the actuarial method to construct the needed life tables. Chi-square test, was used to study the relationship between cancer occurrence and sex, age and stage. The result of this study indicates that the 5 year survival rate (50.1%) with 95% confidence intervals (0.4985-0.5035) in Mosul was between developed and developing countries. The survival of colorectal cancer in men (50.0%) was significantly better than women (43.0%), older patients ≥ 70 years, had a poorer survival rate (25.9%) compared to younger patients <50 years (70.5%) and the survival rate by tumor stage was better in the localized stage (75.4%) than regional and distant stages of (63.6% and 11.7%) respectively.

Keywords: *Colorectal cancer, 5-year survival rate, Mosul Cancer Registry center*

Introduction

Over 1.8 million new colorectal cancer cases and 881,000 deaths are estimated to occur in 2018[1]. Colorectal cancer (CRC) is the third most common cancer in men and the second in women, according to the latest GLOBOCAN worldwide estimation in 2012[1,2]. About 55%of the cases are reported in the more developed countries. The highest rates were estimated to be in Australia/New Zealand: 44.8 and 32.2 per 100,000 in men and women, respectively, and the lowest in Western Africa (4.5 and 3.8 per 100,000)[2]. Colorectal cancer is a major cause of morbidity and mortality throughout the world[3]. It accounts for over 9% of all cancer incidence [4,5]. It is the third most common cancer worldwide and the second most common cause of death[1,4]. It affects men and women almost equally[3–6]. Colorectal cancer is one of the ten leading cancers in Iraq, accounting for 4.8% of estimated cancer cases in males and 3.8% of estimated cancer cases in females[7].

Aim of The Study

The aim of this study is to show the survival rates of CRC patients in Nineveh province for the period 2010 – 2014.

Objectives

1. To describe the sociodemographic characteristics of the CRC patients.

2. To calculate the 5-year survival rate (5YSR), according to the age, sex and stage of the cancer.

Materials and Method

Study Settings:

This was a retrospective cohort study, conducted among patients at the Mosul Cancer Registry center (MCRC). This study protocol was approved by the local ethics committee of Medical Collage, University of Nineveh and also obtained from the directorate of health in Nineveh

Study sample:

The sample of the present study included all colon and rectum cancer patients registered at the Mosul cancer registry center in Nineveh in 2010 to 2014 of all ages and both sexes. A total of 460 cases of CRC, recorded were retrieved from the medical records of MCRC.

The cancer cases are registered with respect to patient number, age, sex, clinical stage and cancer coded according to the International Classification of Diseases

(ICD10)[8,9]. All the data are fitted on Can Reg 3 format and fed into the computerized database of the MCRC.

Staging is done according to the summary stage system[10,11]. The cancer has become invasive and is categorized as local, regional, or distant based on the extent of spread[12]. Stage "unknown" has been recorded to include tumour morphologies for which the summary stage system is not strictly applicable and patients with cancer of an unknown stage or carcinoma in situ were excluded from the present study.

The criteria of the age groups chosen were those used for the international standard cancer patient population[13]. With age been categorized into three groups (<50, 50–69 and 70+ years).

The sex was examined as a potential confounding variable for CRC for presentation of some descriptive results.

Survival Analysis

Survival analysis was carried out using the actuarial method to construct the needed life tables [14]. ***Observed survival rate*** **"OSR"** is the probability of surviving from all causes of death in a group of cancer patients under study. Observed survival was measured from the date of diagnosis to the date of death or censoring, whichever occurred first[14,15,16]. Cancer patient survival was estimated as the cumulative probability (range 0 to 1) of survival up to a stated time after diagnosis [17]. This method has been used in this study to estimate the absolute survival probability [18]. In the present study, period analysis was used to derive 5-year survival estimates for 2010-2014 [19, 20].

Statistical Analysis

95% confidence intervals and calculation of the standard error (s.e.) of the 5YSR obtained by the actuarial method uses the Greenwood's formula[14, 21]. Chi-square test was used to study the relationship between variables and some results[22].

Micro Soft Excel 2010 was used for statistical analysis.

Results

The total number of the CRC cases, according to age, sex and stage of extension are shown in Table 1. The result is significant at $p \leq 0.05$, except for sex, the result is not significant and the chi-square statistic is 2.513.

Table 1: The frequency distribution of the colorectal cancer cases, according to age, sex and stage of disease.

Colorectal Cancer Cases (460)		Date of Diagnosis					Total	%	p-value
		2010	2011	2012	2013	2014			
Age group	<50	22	41	30	29	32	154	33.5	< 0.00001
	50-69	38	34	49	42	61	224	48.7	
	≥70	11	8	20	21	22	82	17.8	
Sex	Female	28	42	50	48	45	213	46.3	0.11291
	Male	43	41	49	44	70	247	53.7	
Stage	Local	14	8	26	17	27	92	20.0	< 0.00001
	Regional	30	42	34	25	51	182	39.6	
	Distant	26	21	27	27	28	129	28.0	
	Unknown	1	12	12	23	9	57	12.4	

To CRC death, about half of people (50.3%) die, is of 55-69 year of age, as shown in Table 2,

Table 2: The frequency distribution of the colorectal cancer deaths, according to age, sex and stage of disease.

Colorectal Cancer Deaths (163)		Date of Diagnosis					Total	%
		2010	2011	2012	2013	2014		
Age group	<50	0	3	11	9	13	36	22.1
	50-69	3	7	17	21	34	82	50.3
	≥70	6	2	6	12	19	45	27.6
Sex	Female	2	6	15	17	36	76	46.6
	Male	7	6	19	25	30	87	53.4
Stage	Local	0	0	3	9	6	18	11.0
	Regional	2	5	11	16	17	51	31.3
	Distant	7	7	16	15	35	80	49.1
	Unknown	0	0	4	2	8	14	8.6

Table 3, shows the CRC survival rate declined from 70.5% in the ≤50 age group to 25.9% among those aged ≥70 years. There was an greater difference in survival rates between female and male, which were 43.0% and 50.0%, respectively and between stages.

Table 3: The 5- year observed survival rate of the colorectal cancer cases, according to overall, age group, sex and stages for the period from (2010-2014)

Colorectal Cancer		OSR	95% CI
	Overall	0.501	0.4985-0.5035
Age Group	<50	0.705	0.7003- 0.7100
	50-69	0.518	0.5127- 0.5240
	≥70	0.259	0.2152- 0.3032
Sex	Female	0.430	0.4251- 0.4343
	Male	0.500	0.4954 - 0.5045
Stage	Local	0.754	0.7469- 0.7603
	Regional	0.636	0.6305- 0.6411
	Distant	0.117	0.0975- 0.1363

Discussion

Previous studies in other countries have reported variable CRC survival rates.

In Asia, the highest survival rates were found in China (68.0%) [23], the lowest rate was in India (33.6%) and Malaysia (34.3%) [24,25]. This study showed that the overall 5YSR for patients with CRC was 50.1%. Various studies from Iran have reported 5YSR of CRC of 47%, 41% and 61% respectively[26-28]. In Saudi Arabia, the overall 5YSR of the CRC was 44.6% [29]. The disparities in CRC survival between Japanese, Mediterranean countries could also be attributed to many factors, together with variations in socioeconomic standing, stage at identification, treatment, medical practitioner characteristics, and hospital factors. In Japan in 2005, the 5YSR was reported at 61.4% [30]. Also, studies in Germany, USA, England, France, and Italy were reported the 5YSR 65%, 65%, 52.7%, 60.3% and 59.3% respectively[31-34]. The 5YSR of patients with CRC in our city is lower than the developed regions. Therefore, we conclude that the survival rate of patients with CRC in Mosul is between developed and developing countries, like other patients in the world depend on various factors such as demographics, pathologic and tumor characteristics, geographical distribution and gene mutation or have a family history of [35,36].

In this study, there is no significant difference in the occurrence of CRC between females and males (p-value= 0.11291), but differences in survival rates were reported, 43.0% and50.0%, for females and males, respectively. Yet, other studies had reported a lower 5YSR in females[2,37]. The absence of gender differences in survival rates was reported in some of the previous studies[23,25]. In a study in Germany and Cuba, the 5YSR in women was better than men that were not similar to the result of our study[38,39]. The reason for better survival in men than women in this study may be due to a higher participation rate in men compared with women for screening programs like fecal occult blood test and colonoscopy[40].

This study showed that the hazard of death increased significantly with increased age being the highest in the age of ≥70 years. This result was reported in other studies [27] that showed that older patients had a poorer survival rate compared to younger patients. However, other studies[26,41] reported no difference in survival according to age. The contradictory results of previous studies on age may be due to the inclusion of patients from single referral centers and poor adjustment for the effect of possible confounds.

One of the most important factors that influence the survival of patients with CRC was the stage of diagnosis. Which were 75.4%, 63.6% and 11.7%, for local, regional and distant stages respectively. This finding is consistent with findings of other studies; in the USA, 5YSR is 90%; survival in local stage, declines to 71% and 14% with regional and distant stages, respectively[34], also in European countries, localized CRC reached levels close to 90% and 15% in the case of distant stage[38], while in Saudi Arabia, 63.3% for localized disease, 50.2% for those with regional disease, and 14.7% for patients with distant stage[29]. But the most important factor for our CRC patient is that the disease diagnosed at an advanced stage[42]. So this significant difference in 5YSR may be due to, poorly established screening program like the fecal occult blood test, sigmoidoscopy and colonoscopy and limited accessibility in developing region[43].

Conclusions

In conclusion, the result of this study indicates that the 5YSR of patients with CRC in Mosul was between developed and developing countries. The survival of CRC in men was significantly better than women, older patients had a poorer survival rate compared to younger patients and the survival rate by tumor stage was better in the localized stage than other stages of CRC.

Conflict of Interest: no conflict of interest.

Source of Funding: self

Ethical Clearance: From Ethical Committee, Medical College, University of Nineveh

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