Case Fatality Rate of Colorectal Cancer in Nineveh

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Abstract Background: Colorectal cancer is the third most common cancer in men and the second in women, according to the latest GLOBOCAN worldwide estimation, and the second most common cause of death. Aim of the study: This study aims to investigate the case fatality rates of colorectal cancer, according to the age, sex and stage of the cancer in Nineveh. Method: This was a retrospective study, conducted among patients at the Mosul Cancer Registry center. Chi-square test for independence was used to study the relationship between age groups, sex and stage of extension variables and some results. Results: about half of people (50.3%) die, is of 55-69 year of age, there good association of age and stage variables with the case fatality rates of cancer, with a p value ≤ 0.05, the result is significant, except for sex. Conclusions: The result of this study indicates that the case fatality rate of patients with colorectal cancer in Nineveh was between developed and developing countries. The case fatality rate of colorectal cancer in men was not significantly differ than women, older patients had a higher case fatality rate compared to younger patients and the case fatality rate by tumor stage was lesser in the localized stage than other stages of the cancer.

Keywords: colorectal cancer, case fatality rate, Mosul cancer registry center

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1. Introduction

1.1. Background

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]. Therefore, this study aims to investigate the case fatality rates of CRC according to the age, sex and stage of the cancer in Nineveh.

1.2. Aim of the Study

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

1.3. Objectives

1. To describe the sociodemographic characteristics of the CRC patients.
2. To calculate the case fatality rates, according to the age, sex and stage of the cancer.

2. Patients and Methods

2.1. Study Settings

This was a retrospective 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.

2.2. 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 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, Recent research suggests that sex differences in immune function and response may also play a role [14].

2.3. Statistical Analysis

Chi-square test for independence is an important method for determining if there is a relationship between variables, was used to study the relationship between age groups, sex and stage of extension variables and some results [15,16].

A P-value of ≤ 0.05 was considered to denote statistical significance. Micro Soft Excel 2010 was used for statistical analysis.

3. Results

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

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

Statistical analysis was done to see the association of age, sex and stage variables with the case fatality rates of cancer, with a p value ≤ 0.05, the result is significant, except for sex, the result is not significant and the chi-square statistic is 0.0105, as was seen in the (Table 3).

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	

*Chi- square test of independence

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. The overall case fatality rate (CFR) of the CRC patients, according to age, sex and stage of disease

Colorectal Cancer Cases (460)		(CFR) %	P value*
Age group	<50	23	< 0.00001Significant
	50-69	37	
	≥70	55	
Sex	Female	36	0.918423 Not significant
	Male	35	
Stage	Local	20	< 0.00001significant
	Regional	28	
	Distant	62	
	Unknown	25	

*Chi-square test of independence

4. Discussion

In this study of the Nineveh population to examine the case fatality rate of colorectal cancer at the province, we highlight the following findings. First, within the age group, the case fatality rates of colorectal cancer were higher for those ≥70 years of age (55%), than in others; (37%) and (23%) among those 50-69 years and <50 years age groups respectively. However, colorectal cancer appears to be increasing among younger persons. [17,18]. In fact, in the United States, colorectal cancer is now one of the 10 most commonly diagnosed cancers among men and women aged 20 to 49 years [19].Second, as the proportion of females in the study population of lesser distinct than for a male, consequently, the case-fatality rates were less different for CRC patients regarding sex adjustable, which (36%) for females and (35%) for male. Third, CRC extension show differences in the population under study, thus case fatality rates were higher in the distant stage (62%) than in other stages of CRC. The difference in staging may reflect the difference in access to screening programs [20,21] or medical care after the development of symptoms. The reasons for the increased risk are not clear, but it likely due to inherited genes, shared environmental factors, or some combination of these. However, even after controlling for the stage of disease at diagnosis, the case fatality rate was increased in patients [22].

The findings of the present study indicate significant variability for both age groups and stage of cancer extension in case fatality rate, which may suggest differences at the province level in screening programs, as well as a treatment after diagnosis.

Further studies are needed to determine whether differences within province are due to risk factors, including diet and lifestyle; patient preferences for and adherence to recommendations about screening or therapy; or the availability of screening, diagnostic facilities, and/or cancer treatment.

5. Conclusion

In conclusion, the result of this study indicates that the case fatality rate of patients with CRC in Mosul was between developed and developing countries. The case fatality rate of CRC in men was not significantly differ than women, older patients had a higher case fatality rate compared to younger patients and the case fatality rate by tumor stage was lesser in the localized stage than other stages of CRC.

Ethical Clearance

From Ethical Committee, Medical College, University of Nineveh.

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