Cancer incidence in Sirte area, middle region of Libya: first results from Sirte Oncology Centre

*** Dr .Habsa A. A. Amshahar**

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Abstract: Background: Cancer is a major health problem particularly in developing countries with limited cancer data. Therefore, cancer-registry data and studying the incidence are necessary for a local epidemic. The aim of the current study was to estimate the incidence of cancers in Sirte area that has never been studied. **Materials and Methods:** A retrospective study of cancer cases diagnosed in the pathology department at Sirte Oncology Centre from January 2021 to December 2023.

Results: Out of 174 diagnosed cancer cases, 48.3% were males, and most of reported malignant cases (63.2%) were at age greater than forty. Breast cancer was the commonest cancer among all malignant cases (25.3%), and was the commonest cancer among the females (46.7%), while bladder cancer was the commonest cancer in males (34.5%). Cancers of both genders has been increased during the studied period in a similar pattern. **Conclusion:** Breast cancer and bladder cancer were the commonest cancers in females and males respectively. The incidence of cancers in Sirte city has increased with the years of study. Cancer registry and performing further cancer epidemiological studies focused on cancers is critical, particularly after the age of forty.

Keywords: Cancer, Malignancy, Cancer Incidence, Registry, Libya.

معدل الإصابة بالسرطان في منطقة سرت، المنطقة الوسطى من ليبيا: النتائج الأولى من مركز أورام سرت

د .حبصة علي احمد

استاذ مساعد، قسم علم الأمراض، كلية الطب البشري، جامعة سرت، ليبيا.

المستخلص: خلفية البحث: يعد السرطان مشكلة صحية كبيرة خاصة في البلدان النامية ذات البيانات المحدودة عن السرطان. ولذلك، فإن بيانات تسجيل السرطان ودراسة حدوثه ضرورية للوباء المحلي. الهدف من الدراسة الحالية هو تقدير معدلات الإصابة بالسرطان في منطقة سرت والتي لم تتم دراستها من قبل.

طرق ومواد البحث: دراسة استرجاعية لحالات السرطان التي تم تشخيصها في قسم علم الأمراض بمركز الأورام بسرت في الفترة من يناير 2021 إلى ديسمبر 2023. النتائج: من بين 174 حالة سرطان تم تشخيصها، كان 48.3% منها من الذكور، وكانت معظم حالات السرطان الخبيثة (63.2%) في سن أكبر من الأربعين. وكان سرطان الثدي هو السرطان الأكثر شيوعا بين جميع الحالات الخبيثة (25.3%)، وكان السرطان الأكثر شيوعا بين الإناث (46.7%)، في حين كان سرطان المثانة هو السرطان الأكثر شيوعا بين الذكور (34.5%). وقد تزايدت حالات السرطان لدى كلا الجنسين خلال فترة الدراسة بنمط مماثل. الاستنتاج: سرطان الثدي وسرطان المثانة هما السرطانان الأكثر شيوعاً بين الإناث والذكور على التوالي. تزايدت حالات الإصابة بالسرطان في مدينة سرت مع سنوات الدراسة. يعد سجل السرطان وإجراء المزيد من الدراسات الوبائية للسرطان التي تركز على السرطان أمرًا بالغ الأهمية، خاصة بعد سن الأربعين.

الكلمات المفتاحية: السرطان، الأورام الخبيثة، الإصابة بالسرطان، السجل، ليبيا

Introduction:

Cancer is a major cause of morbidity and mortality, where It considers the first or second important cause of preventable and premature death (i.e. at ages 30–69 years) in many countries[1]. One-third of cancer cases are due to lack of physical activity, unhealthy diet, alcohol and tobacco use, aging and infections [2]. The majority of cancer-related deaths (70%)

* **Assistant professor, Pathology Department, Faculty of Medicine, Sirte University, Sirte, Libya. habsa33@su.edu.ly**

occur in low and middle - income countries, the cancer burden projected to exceed 27 million new cancer cases per year by 2040 [1], and by 77% by the year 2050 Globally [3], and is predicted to increase more than 92% in 2020 and 2040 in sub-Saharan Africa [1].

Therefore, the cancer registry is important for doing searching on the cancer, and are useful for providing the cancer-information patterns essential for evaluating health services for prevention and control programs polices[4 5]. Where cancer-registry data are useful to show the burden of cancer across the different geographic areas [6], However, most developing Countries are facing the problem of having little data about the rate of cancer incidence [7]. In Libya, the cancer incidence has been demonstrated in some studies from areas/ cities of the western, eastern as well as southern regions of Libya and some areas of the middle region of Libya [8 9 10 11 12 13 14 15 16 17 18 19], so continuous incidence- and cancer registry- based studies overall of the country are important. In Sirte, no study was done on cancer incidence, so this is the first study to provide the report on cancer incidence based on data from Sirte Oncology Centre in Middle Libya from 2021 to 2023.

The aim of the current study was to estimate the incidence of cancers in the Sirte area in the middle region of Libya that has never been assessed.

Materials and methods:

A retrospective cross-sectional study includes all cases reported with malignant histopathology diagnosis at the Department of Histopathology of Sirte Oncology Centre from January 2021 to December 2023 that were confirmed by histopathologists, cases with non-malignant histopathology reports were excluded. Pathology reports was retrieved and the type/site of cancer and diagnosis was reviewed by pathologist to avoid overestimation or underestimation of some cancer types. Data were included demographic characteristics, such as age, gender, date of diagnosis, and type of cancer collected and analyzed.

Data analysis:

The data were analyzed using IBM SPSS version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics of qualitative variables, expressed as the frequencies and percentages were computed, and some distributions in relation to the age groups were performed with a calculation of both the number of cases and percentages and for descriptive statistics of quantitative variables the mean, median and range were used to describe central tendency and dispersion.

Results:

A total of 174 cases were recorded at the Department of Histopathology of Sirte Oncology Centre (84 (48.3%) were males, and 90 (51.7 %) were females), the age distribution of patients is presented in Figure 1. with a minimum age of 18 years, a maximum of 94 years and a median age of 55 years. The majority of malignant cases (n= 110, 63.2%) were in the age groups of 41 years and above.

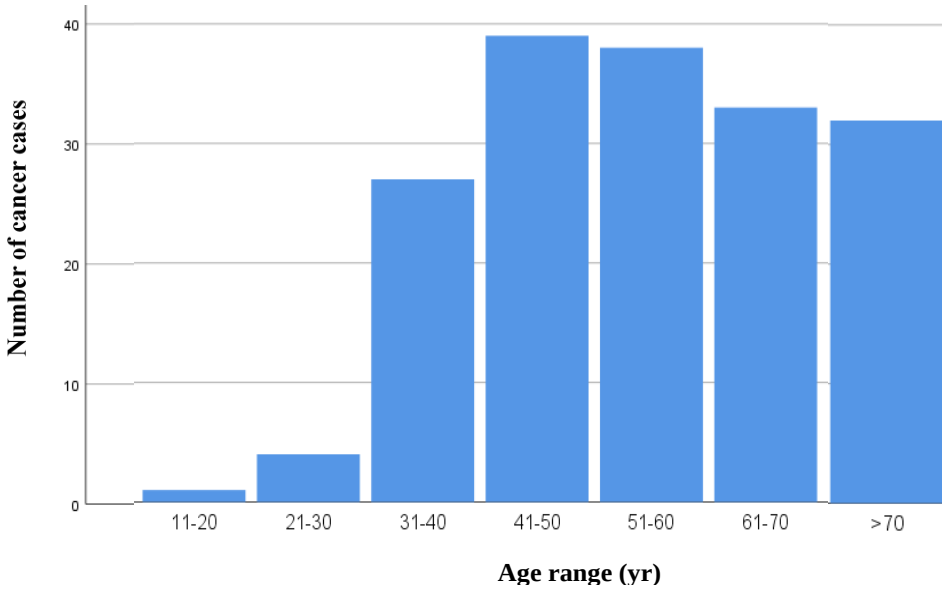

Figure 1. Age distribution of all cancer in the study.

This study evaluated the rate of cancer incidence over the study period from 2021 to 2023 as shown in Figure 2.

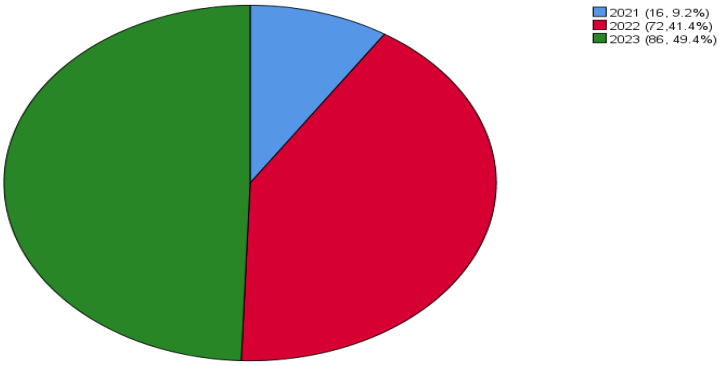

Figure 2. Cancer incidence over the study period.

The distribution of cancer cases for both genders in different body sites during 2021–2023 is listed in Table 1. Accordingly, the most common diagnosed malignancies in the study population were breast cancer, with 44 (25.3%) cases, followed by bladder tumours (32, 18.4%), thyroid (23, 13.2%) and prostate (22, 12.6%).

Among females, breast and thyroid cancers are the most reported cancer sites (42 (46.7%); 16 (17.8%), respectively), whereas bladder, prostate and colorectal cancer were the commonest cancers in men (29 (34.5%); 22 (26.2%); 10 (12%), respectively).

Table (1). Distribution of malignancies in the study population.

Cancer Site	Female, n (%)	Male, n (%)	Total, n (%)
Breast	42 (46.7%)	2 (2.4%)	44 (25.3%)
Uterus	5 (5.6%)	0	5 (2.9%)
Colorectal	8 (8.9%)	10 (12%)	18 (10.3%)
Bladder	3 (3.3%)	29 (34.5%)	32 (18.4%)
Thyroid	16 (17.8%)	7 (8.3%)	23 (13.2%)
Lymphoma	0	5 (6.5%)	5 (2.9%)
Skin	4 (4.4%)	3 (3.6%)	7 (4%)
Salivary glands	3 (3.3%)	0	3 (1.7%)

Prostate	0	22 (26.2%)	22 (12.6%)
Kidney	0	1 (1.2%)	1 (0.6%)
Cervix	1 (1.1%)	0	1 (0.6%)
Gallbladder	2 (2.2%)	0	2 (1.1%)
Ovary	1 (1.1%)	0	1 (0.6%)
Small intestine	0	1 (1.2%)	1 (0.6%)
Stomach	1 (1.1%)	1 (1.2%)	2 (1.1%)
Soft tissue	2 (2.2%)	1 (1.2%)	3 (1.7%)
Oesophagus	0	1 (1.2%)	1 (0.6%)
Metastasis	2 (2.2%)	1 (1.2%)	3 (1.7%)
Total	90 (51.7%)	84 (48.3%)	174 (100%)

Table 2 demonstrates the incidence rate for cancers in both genders that increased from 16 (9.2%) cases in 2021 to 72 (41.4%) cases in 2022 and 86 (49.4%) cases in 2023.

Table 2. Incidence rate for cancers during 2021- 2023.

The year	**Frequency (%)**
2021	16 (9.2%)
2022	72 (41.4%)
2023	86 (49.4%)
Total	174 (100%)

Among females, breast cancer remained the most reported cancer site, with an increase in the incidence rate from 6 (13.6%) in 2021 to 21 (47.7%) cases in 2023 [Table 3]. Thyroid cancer was the second most common cancer with a slight increase in the incidence rate from 1 (4.3%) in 2021 to 8 (34.8%) cases in 2023. Colorectal and bladder incidence rates ranked third, and fourth most-reported cancer sites, respectively.

For males, bladder cancer remained the most reported cancer site during the study period with a slight increase in the incidence rate from 1 (3.1%) in 2021 to 16 (50%) cases in 2023. Prostate cancer was the second most common cancer with an increase in the incidence rate from 4 (18.2%) in 2021 to 11 (50%) cases in 2023, followed by colorectal, thyroid and breast respectively [Table 3].

Table 3. The foremost cancer sites for both genders during 2021- 2023

Cancer site	**Cancer type (frequency, n (%) per year**						**Total n (%)**
	2021		**2022**		**2023**		
	Female	**Male**	**Female**	**Male**	**Female**	**Male**	
Breast	6 (13.6)	0	15 (34.1)	0	21 (47.7)	2 (4.5)	44 (25.3%)
Bladder	2 (6.3)	1 (3.1)	0	12 (37.5)	1 (3.1)	16 (50)	32 (18.4%)
Thyroid	1 (4.3)	1 (4.3)	7 (30.4)	3 (13)	8 (34.8)	3 (13)	23 (13.2%)
Prostate	0	4 (18.2)	0	7 (31.8)	0	11 (50)	22 (12.6%)
Colorectal	0	0	6 (33.3)	4 (22.2)	2 (11.1)	6 (33.3)	18 (10.3%)

Discussion:

Cancer epidemiological studies are important to understand the cancer problem among given population. It is important to study cancer rates in different areas of the country and determine the differences, hence, there are many studies conducted in some areas of Libya[8 9]

[10] [11] [12] [13] [14] [15] [16] [17] [18] [19] , however, no published study has previously investigated cancer incidence in the Sirte District in the middle region. Therefore, the current study evaluated the rate of cancer incidence in the region focusing on cases diagnosed from 2021 to 2023.

In the recent study, the overall cancer was more among females than males (48.3% were males, and 51.7 % were females), our results differ from previous reports in eastern (52.5% were male and 47.5% were female) [17] and western Libya (51.1% were male and 49.9% female) [15] . However, it is concordant with previous studies in southern Libya (37.8% males and 62.2% females) and in the Misrata area in middle Libya (44.7% males and 55.3% females) and the Tobruk area in eastern Libya (31.1% males and 68.9% females)[13] [14] [16]. Our study shows that, the most common cancer was breast cancer with 44 (25.3%) cases as shown in Table1, is comparable to previous reports from other regions of Libya [10] [17] [20] [21]. Breast cancer is a common cancer worldwide, and an early detection program is necessary to detect cases at earlier stages [22]. Generally, the second most common cancer in both genders was bladder cancer (32, 18.4%) (Table1), this is inconsistent with other studies reporting colorectal cancer as the second most common cancer [10] [13] [16] [19]. and inconsistent with the Egyptian study, where hepatocellular carcinoma (HCC) was the commonest tumor (23.8%), followed by breast (15.4%), and bladder cancer (6.9%) [21]. The recent study shows incidence rate differences in both sexes according to the type of cancer (Table 1 and Table 3). These differences may be attributed to physiological and psychological factors, Sex hormones such as estrogen and genetic and molecular disparities between males and females. Whereas among females, breast cancer is the commonest cancer which is consistent with other studies [10] [13] [14] [17]. while the second most common cancer was thyroid cancer, which is contradictory with other studies [10] [13] [14]. This encourages further studies for etiological and risk-related factors. Furthermore, our results show that bladder cancer was the most common in men followed by prostate cancer, however this is inconsistent with the results reported from previous studies in East and West Libya [9] [10]; in eastern and western Libya (lung cancer followed by colorectal cancer) and southern Libya (colorectal cancer followed by prostate)[14], and Tobreq city in eastern Libya (bladder followed by colorectal cancer) [13].

The current study revealed that, the incidence of malignant tumors rises dramatically with age; the majority of diagnosed cancer cases were found in the older age groups of 41 years and above (Figure 1). This is concordant with other studies from Libya [10] [13] [23].

Lung cancer is one of the most common cancers in Libyan men cancer patients [10] [11] [24]. However, there were no histopathology reports for lung over the study period, lacks trained specialists and the proper equipment to obtain biopsies in the Sirte Oncology Center and other medical institutions in the city, and the cases were referred to other institutions in eastern or western Libya to obtain samples and histopathology reports. There were no reports for the central nervous system, which may be attributed to lack of trained specialists and equipment to obtain biopsies in the center and cases referred to other countries's health institutions. There was an increase in the number of diagnosed cancer cases during the study period from 2021 to 2023 (Figure 2 & Table 2). This may be related to the improved health services in the center, such as mammogram screening programmers, gastrointestinal endoscopic screening and other surgical, urological and gynecological health services, in addition, the area has witnessed two wars in 2011 and 2016; it suffered from a deterioration of services and worsening living and definitely contributed to increased risk for cancer.

Our study is limited by the fact that the Sirte Oncology Center is relatively new, and lacked some important demographic data and risk factors for cancer development, it is also limited due to the absence of trained lung as well as central nervous system specialists and related equipment.

In addition, the diagnosis of some cancers might be based on other diagnostic methods such as tumor markers or characteristic radiological features including lung, central nervous

system, urinary tract, prostate, and hepatocellular carcinoma (HCC)[25] which based in diagnosis on non-invasive criteria and/or pathology findings [26].

Conclusion:

In our study, the cancer incidence rate increased with age, breast and thyroid cancers were the most common cancers in women, and bladder and prostate cancers were the most common in men, followed by colorectal cancer in both women and men. So, there is an urgent need for the improvement of the provided health services for the overall management of all cancers and the cancer registry as well, and to overcome limitations for further research, as authors recommend further epidemiological and etiological association studies and study to identify cancer-related risk factors. We anticipate our data will help and contribute to improving knowledge and research of various cancers in this region and consequently provide a useful guide for the health authorities to design health strategies, and set into action a cancer prevention, and control plan.

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