Prevalence of cancer related to sociodemographic characteristics and prevention strategies in Mogadishu, Somalia
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Abstract:

Background: Cancer is the second leading cause of death globally and is estimated to account for 9.6 million deaths in 2018. Lung, prostate, colorectal, stomach, and liver cancers are those most common among men; while breast, colorectal, lung, cervix, and thyroid cancers are most frequent types among women. Objectives: The present study aims to assume a leading role for forthcoming researches to establish a national cancer registry database in Mogadishu, Somalia. Methodology: This is a retrospective 6-months analysis of cancer patients whose data were achieved from pathology department registries of Liban and Veritas Hospitals in Mogadishu, Somalia. Results: 126 (M/F: 51 (41.5%) / 75 (59.5%)) patients were included in the study. Esophagus had been recorded as the most frequent site of organ which was diagnosed with cancer (n=74 (58.7%)). Squamous cell carcinoma was recorded to be the most frequent histopathologically confirmed subtype (n=91 (72%), M/F:34/57), which was followed by adenocarcinoma (n=16 (12.7%), M/F:11/5) and sarcoma (n=6 (4.8%), M/F:5/1) consecutively. Majority of both squamous cell carcinoma (n=37 (40.7%)) and sarcoma patients (n=3 (50%)) were >60 years of age, whereas patients diagnosed with adenocarcinoma (n=7 (43.75%)) were between 41-50 years of age. Conclusion: Emphasis should be placed on finding ways to ensure early detection and diagnosis of cancer in Mogadishu, Somalia promptly. That should begin by giving educational programs to the community to raise public awareness, and establishing national cancer registry to reveal up-to-date data in order to make risk assessment and coordinate management strategies accordingly.

Keywords: Cancer; Prevalence; Somalia; Management

Introduction
Cancer is one of the leading causes of death, and a critical barrier against life span in the 21st century. Its incidence and mortality rates are rapidly growing worldwide as socioeconomic and geographic differences are of the main causative factors1,2. Cancer transitions are most prominent in countries with emerging economies in which increasing magnitude of the disease is paralleled by a changing profile of common cancer types3. Such that, there is an outgrowth of infection and poverty related cancers in low-middle income countries (LMIC)4-6.

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Prevention plans had led to a decrease in incidence rates for some cancers, such as cervical cancer (in most regions of Sub-Saharan Africa). Though, most LMICs are still in need of treatment and support due to increasing number of cases.

Asia and Africa have higher proportions of cancer deaths compared to most other regions around the world. Certain cancer types are more prevalent and have higher mortality rates which are found highly associated with poverty and also lack of an established national cancer registry as well.

Currently, Somalia does not have a national cancer registry program that would collect data from cancer patients around the country in order to take necessary measures for control and management. This shortage of data had brought the need to put forward the actual status of cancer distribution in Mogadishu, Somalia and to assume a leading role for forthcoming researches to establish a national cancer registry database that will give huge information about cancer and ways of prevention in Mogadishu, Somalia.

Herein; we aimed to describe the magnitude and distribution of specific cancer types in territory of Mogadishu, Somalia and aimed to make suggestions for prevention.

**Materials and Methods**

Present study is retrospective analysis of patients whom were diagnosed with different types of cancers in Liban and Veritas hospitals in Mogadishu, Somalia between January-June 2019. Data collected from participants included age, gender, residence of the patients, tumor site, type and frequency of cancers. The results were demonstrated as frequency tables. All patients histologically confirmed were enrolled in the study.

Cancer prevalence and its distribution among society had been chosen as dependent variables. Gender, age, residence of the patients, tumor location and cancer type were determined as independent variables.

**Statistical analysis**

The obtained data were entered into Statistical Package for Scientific Solutions (SPSS) version 21 and had been analyzed.

**Ethical approval**

Required ethical permissions had been taken from ethical commities of Liban and Veritas Hospitals.

**Results**

116 (36.7%) patients had been referred to Liban hospital, and remaining 10 (4.7%) patients had been referred to Veritas hospital of whom all had been confirmed with various types of cancer between January-June 2019.

Majority of the study population (M/F: 51/75 (41.5% / 59.5%)) was older than 60 years of age of which consisted of 47 patient (37.3%). The remaining in decreasing order was such as; 30 patients (23.8%) were between 51-60 years old, 26 patients (20.6%) were between 41-50 years old, 15 patients (11.9%) were between 31-40 years old and last of all, 8 patients (6.3%) were between 21-30 years old (Table 1). Quartile range for the age of the population was between 23-90 years.

**Table 1. Distribution of cancer patients according to age**

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-30 years</td>
<td>8</td>
<td>6.35</td>
</tr>
<tr>
<td>31-40 years</td>
<td>15</td>
<td>11.90</td>
</tr>
<tr>
<td>41-50 years</td>
<td>26</td>
<td>20.63</td>
</tr>
<tr>
<td>51-60 years</td>
<td>30</td>
<td>23.81</td>
</tr>
<tr>
<td>&gt; 60 years</td>
<td>47</td>
<td>37.30</td>
</tr>
<tr>
<td>Total</td>
<td>126</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Lower-Shabelle and Hodan regions consecutively had highest frequency of incidence for cancer of which each had 18 patients (14.3%), then after Middle-Shabelle had 9 patients (7.1%), and Wadajir and Karaan regions hosted 7 patients (5.6%) each (Figure).

Esophagus was the most frequent site for cancer with 74 patients (58.7%), and that was followed by cervix with 7 patients (5.5%), then after with colon and endometrium of each constituted by 5 patients (4%), rectum with 4 patients (3.2%), and prostate and breast of each with 3 patients (2.4%) respectively (Table 2).
Figure. Residential distribution among cancer patients

Table 2. Demonstration of cancer sites

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total (n=)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>ESOPHAGUS</td>
<td>32</td>
</tr>
<tr>
<td>CERVIX</td>
<td>0</td>
</tr>
<tr>
<td>ENDOMETRIUM</td>
<td>0</td>
</tr>
<tr>
<td>COLON</td>
<td>5</td>
</tr>
<tr>
<td>RECTUM</td>
<td>3</td>
</tr>
<tr>
<td>PROSTATE</td>
<td>3</td>
</tr>
<tr>
<td>BREAST</td>
<td>0</td>
</tr>
<tr>
<td>ANUS</td>
<td>1</td>
</tr>
<tr>
<td>THYROID</td>
<td>0</td>
</tr>
<tr>
<td>EXTREMITY</td>
<td>1</td>
</tr>
<tr>
<td>TONGUE</td>
<td>0</td>
</tr>
<tr>
<td>GASTRIC</td>
<td>1</td>
</tr>
<tr>
<td>BLADDER</td>
<td>0</td>
</tr>
<tr>
<td>EYE</td>
<td>0</td>
</tr>
<tr>
<td>KNEE</td>
<td>1</td>
</tr>
<tr>
<td>NASAL</td>
<td>0</td>
</tr>
<tr>
<td>PELVIC</td>
<td>1</td>
</tr>
<tr>
<td>THIGH</td>
<td>1</td>
</tr>
</tbody>
</table>

Vast majority of histopathological evaluations had been confirmed as squamous cell carcinoma (SCC) (n=91 (72%)), 16 patients (12.7%) were diagnosed with adenocarcinoma and sarcoma diagnosis was given for 6 patients (4.8%) (Table 3).

SCC had been recorded higher in count among female population (M/F: 37/54), whereas adenocarcinoma and sarcoma patients were found more prevalent among male group having ratios of (M/F: 11/5), (M/F: 5/1) respectively.

Other than that, percentage of elderly population had been found more profound for SCC and sarcoma patients; such as 37 (40.7%) patients older than 60 years of age had SCC and also 3 (50%) patients with sarcoma were found older than 60 years of age. On the other hand, most of adenocarcinoma patients were among younger age group of whom 7 (43.8%) of them were between 41-50 years of age.

Discussion

There is no published report yet discussing frequency and demographic characteristics of various types of cancers prevalent in Somalia republic. In that regard, present study is the first of its type evaluating demographic characteristics of carcinoma according to a certain region of which is a member of LMICs, and also discussing management strategies for prevention.

On the lights of clinical findings, common age group
affected by carcinoma was found as >60 years of age with 47 cases, and this result show concordance with other studies from Uganda, Ethiopia and Sudan where most of patients were between 50-69 years of age. Whereas, research studies conducted in Eritrea, Djibouti and UAE (United Arab Emirates) had declared dissimilar results of which majority of study group were between 15-49 years of age.

Most common age group for cancer occurrence had been declared between 50-69 years of age in United Kingdom and United States according to a study conducted by Max Roser et al. Cancer incidence show a peak rate in later decades of life in western world. This disparity between high income and low-middle income countries may be attributed to differences in level of education, socioeconomic status and cultural features.

Present study had revealed a female predominance with a ratio of 1/1.47. Though, findings of the present study regarding gender variances are not sufficient to imply any meaning. More similar studies boundering with bigger patient groups in that region are needed to make accurate assessments regarding the issue.

Esophageal carcinoma had been found as the most common type of cancer for patients evaluated in Mogadishu, Somalia. Studies done in Uganda revealed that cervix carcinoma was the leading cancer type among all cancer types in whole country having a rate of 19.7%.

Another dissimilar finding had been declared for breast carcinoma retrieved from cases in Djibouti, Eretria and Ethiopia having ratios of 26.1%, 23.5% and 22.6% respectively as the most frequently observed cancer type.

Findings of present study considering female predominance for esophageal carcinoma show concordance with findings of relevant studies conducted in Djibouti, Eretria and Ethiopia which had declared male to female ratio of 1/1.52, 1/1.36 and 1/1.73 respectively. Besides, our study report similar results with another research study conducted in Ethiopia which claim thyroid carcinoma predominance in favor of female gender with a ratio of 1/2.35. Though, controversy exists considering clinical findings of research study in Uganda which declared an apparent male predominance for esophageal carcinoma having a ratio of 3.44/1.

Indoor air pollution from charcoal burning is a known carcinogen. A probable risk factor thought as a causative agent is the smoke produced by the burning of charcoal which is used for cooking in most urban places especially.

Two independent studies driven in China and India reported indoor air pollution from charcoal
burning as a certain risk factor for esophageal and hypopharyngeal carcinoma. Those references strengthen our claim for our study which had stated indoor air population as a real threat for Somalia people, especially female gender under risk of esophageal carcinoma. This may be attributed to social life habits of Somalia people of which female folk exclusively involved in house work, particularly in kitchen for cooking and preparing food unlike their gender counterparts. Another logical explanation for female predominance may be due to society’s perspective in health-seeking of which differs genders as giving females priority in health care system in all around the country. Thus, this may lead to higher rates of female cancers encountered in community.

Current results had put forward a remarkable male predominance considering prevalence of colorectal carcinoma between three to five times more frequent compared to female gender. Somalia men generally consume meat more often compared to females, and also have greater access to it (in restaurants, festivals, etc.). It is a known fact that there is a close relationship between red meat consumption and risk of colorectal carcinoma.

The variances between histopathological types of cancer for our study and other relevant studies had been well observed. Those differences may be attributed to lifestyle changes, geographical features and occasionally certain risk factor. In western countries, tobacco smoking and alcohol consumption are accepted as major risk factors. But in Somalia, smoking cigarette and alcohol consumption vice versa are not common among society. However, Somalia people commonly prefer drinking hot beverages with high amount of sugar; particularly tea and coffee which irritate the mucosa of the esophagus that eventually lead to chronic esophagitis on the long term and that has been related to an increased risk of esophageal carcinoma. Unfortunately, it was difficult to obtain adequate feed-back about tobacco use and frequency of drinking hot beverages (tea and coffee) in Somalia in order to make a coherent relationship with occurrence of esophageal carcinoma.

Other probable risk factor for high occurrence of esophageal carcinoma is ‘Qat plant’; which is chewed in most regions of Somalia that bounders substantial amounts of ‘tannins’ substance that thickens the mucosa of the oropharynx and esophagus, and that may count as a carcinogenic factor as well.

Retrospective review of medical databases of two hospitals came out as a major drawback for the present study due to incomplete and missing information of demographic data in order to make accurate evaluations for the actual prevalence and status of cancer types as well as for assessment of major risk factors. Also, insufficient input of data concerning clinical follow-up of patients diagnosed with different cancer subtypes had prevented to make any prediction about staging of cancers among community. All these issues are major limitations of the present study.

Conclusion

Present study bears a leading role for other studies in future as it serves scientific facts as well as awareness about actual status of cancer disease and its major risk factors in Somalia. Herein, we recommend to pay attention to some preventable risk factors identified in this research study such as air pollution due to indoor charcoal use, high amounts of smoked-meat and hot beverage consumption, chewing ‘Qat plant’, low intake of vegetables, lack of physical activity. It is also obligatory to establish a population-based national surveillance registry to improve the accuracy of information obtained from referral centers and to provide necessary information for health care initiatives for assessment of actual risk factors and to take preventive measures accordingly to have control of cancer.

Authorship Contributions:

AAW, OA made contributions to the conception and design of the study
AAW and RES conducted the data analysis with support from MMM
AYG, OA provided clinical guidance
All authors made substantial contributions to the interpretation of the findings
AAW, and OA contributed to drafting and revising the manuscript for intellectual content, and approved the final version for submission.

Informed Consent: Required informed consent was obtained from the patients.

Declaration of Competing Interest: None.

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