

# The pattern and distribution of malignant neoplasms among Yemeni patients

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## ABSTRACT

**Objective:** This research was aimed at describing the pattern of malignancies among 1,491 patients during 1996 through to 2000 and to explore association with age, sex and site of cancers.

**Methods:** A research was carried out at a Histopathology Center in Sana'a, Republic of Yemen between the period August 1996 through to August 2000. All specimens were diagnosed by one pathologist based on the International Classification of Disease for Oncology.

**Results:** Results revealed comparable male: female ratio (1:0.92) and mean age of  $46.1 \pm 22.8$  in males and  $44.2 \pm 18.3$ . The most common cancers were the gastrointestinal tract malignancies, 22%. Lymph node cancers constituted 16%, followed by head and neck malignant tumors 12%, skin 10%, urinary tract 8%, bone and soft tissue 8%, breast 8%, female genital system 5%, thyroid gland 2% and finally male genital system, bone marrow and central nervous system/eye 2% each. For female patients breast cancers and gastrointestinal tract cancers were equally the

most frequent malignancies. Skin cancers, followed by gastrointestinal tract and male genital system affected mostly older age patients. While bone marrow followed by central nervous system and eye, then bone and soft tissue cancers were mostly diagnosed in young age patients. Within the gastrointestinal tract liver was the most affected site 33% and adenocarcinomas were the most frequent diagnosed type 42%. Among lymph nodes malignancies non-Hodgkin's lymphoma constituted 42%. Oral cavity cancers constituted 73% of head and neck malignancies, where squamous cell carcinoma constituted 65%.

**Conclusion:** Gastrointestinal tract in general with breast in females, were the most frequent sites of malignancies in the Republic of Yemen. Adenocarcinoma and squamous cell carcinoma were the most frequent types.

**Keywords:** Age, malignancies, sex, site, type.

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Cancer is still one of the major health problems worldwide with increasing frequency, especially with increased modernization, increased exposure to radiation and predisposition to a large number of carcinogenic agents.<sup>1</sup> In 1985 the World Health Organization (WHO) reported 9 million new cases of cancers and 5 million deaths worldwide annually,<sup>2</sup> 5% of the new cases had occurred in the Eastern Mediterranean Region.<sup>3</sup> Although a national cancer register is not available in the Republic of Yemen, new cases of cancers are estimated to be around 17,000 per annum<sup>2</sup> according to 1999 estimations. There are only few, published studies of the pattern

of cancers or some malignancies in some parts of the Republic of Yemen.<sup>4,5,6,7</sup> Cancer incidence and pattern of malignancies vary widely from region to region.<sup>8</sup> In the United States of America (USA) breast cancer ranked first in female patients 24%, followed by gastrointestinal tract malignancies (GIT), both sexes combined 18%, female genital system 11.5%, urinary tract cancers 10% and male genital system malignancies 9%.<sup>9</sup> In a study conducted in the Kingdom of Saudi Arabia GIT malignancies represented 24%, followed by Hodgkin's disease non-Hodgkin's lymphoma 15%, thyroid cancer 7% bone marrow 6%, skin cancers 6% and breast 5%.<sup>10</sup>

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In southeastern governorates of the Republic of Yemen, GIT malignancies were the most prevalent 14%, followed by breast cancers then lymphomas 12%, female genital system 12%, head and neck 10%, bone soft tissue 9% and finally thyroid cancers 8%.<sup>4</sup> Distribution of cancers based on sex, males accounted for 56% and females 44% in Oman.<sup>11</sup> In a study from the Kingdom of Saudi Arabia 58% were males and 42% were females.<sup>10</sup> In Yemeni patients from the southeastern governorates the percentages were 53% female patients and 47% males patients.<sup>4</sup> In the USA 61% were females and 39% were males.<sup>9</sup> The purpose of this study was to describe the pattern of malignancies in the Republic of Yemen. Most cancer patients are referred to Sana'a for further investigations and therapy, where most of the histopathologists and all oncologists are practicing. Therefore, this study would serve as a baseline description of cancers in the Republic of Yemen. Furthermore, to explore association of cancers with age and sex of patients in comparison with literature.

**Methods.** One thousand four hundred and ninety one patients from different hospitals in Yemen, were referred to one Histopathology Center in Sana'a, and were diagnosed to have cancer during the period August 1996 through to August 2000. The

International Classification of Diseases for Oncology (ICD-O) of the WHO was adopted by the anatomic and histopathologic classification of malignancies. Verification of some selected diagnoses was made through a control program with the Department of Pathology in the University of Graz in Austria. The results were compared with other local, regional and international studies. The site of cancer, age and sex of patients was fed into a computerized data sheet (Excel). Data were analyzed by SPSS, to find means, SD, Chi Sq test and T-test. Significance level of  $\leq 0.05$  was used. Effort was made to avoid case duplication.

**Results.** Out of 1491 cancer patients 52% were males and 48% females. The mean age of male patients was 46.1 +/- 22.8 years, while that of female patients was 44.2 +/- 18.3 years. These mean ages were found statistically comparable (P=0.08). Gastrointestinal tract malignancies (n=322) were the most common (Table 1). Lymph node, head and neck, urinary tract, skin and bone soft tissue malignant tumors, followed in male patients. While breast cancers in female patients together with GIT malignancies ranked first, followed by lymph node, skin, genital tract and finally head and neck cancers. The highest mean ages were found among patients

**Table 1** - Frequency, age and sex distribution of malignancies according to the site among Yemeni patients 1996-2000.

Site	Frequency (%)	Age in Years (Mean ± SD)	Sex		Significance
			Female	Male	
Gastrointestinal tract	322 (22)	54.7 ± 16.4	110	212	<0.0001
Lymph nodes	235 (16)	35.5 ± 22.2	103	132	0.092
Head and neck	178 (12)	49.3 ± 17.3	74	104	0.04
Skin	155 (10)	55.5 ± 16.8	81	74	0.151
Urinary tract	120 (8)	48.2 ± 19.7	31	89	<0.0001
Bone and soft tissue	118 (8)	29.2 ± 20.2	49	69	0.084
Breast	116 (8)	44.6 ± 12.8	110	6	<0.0001
Female genital system	80 (5)	44.9 ± 15.4	80	-	NA
Thyroid gland	34 (2)	41.2 ± 15.7	28	6	<0.0001
Male genital system	29 (2)	54.1 ± 22.9	-	29	NA
Bone marrow	29 (2)	18.3 ± 20.4	14	15	0.98
CNS and Eye	28 (2)	22.9 ± 25.3	12	16	0.36
Others	47 (3)	40.0 ± 21.5	24	23	0.39
<b>Total</b>	<b>1491 (100)</b>	<b>45.16 ± 20.77</b>	<b>716</b>	<b>775</b>	

SD=standard deviation, NA=not applicable, CNS=central nervous system

**Table 2** - Distribution of gastrointestinal malignancies according to type and site among Yemeni patients 1996-2000.

Type of Cancer	n (%)	Site of cancer	n (%)
Adenocarcinoma	135 (42)	Liver	105 (33)
Hepatocellular carcinoma	73 (23)	Oesophagus	74 (23)
Squamous cell carcinoma	58 (18)	Stomach	69 (21)
Non-Hodgkin's lymphoma	29 (9)	Colorectal	63 (20)
Undifferentiated carcinoma	16 (5)	Gallbladder	8 (2)
Hepatoblastoma	4 (1)	Pancreas	3 (1)
Others	7 (2)		
<b>Total</b>	<b>322 (100)</b>	<b>Total</b>	<b>322 (100)</b>
n=number			

with skin, GIT and male genital system (prostate and testis) malignancies. Whereas the lowest mean ages were found among patients with bone marrow, CNS / eye cancers and bone/soft tissue malignant tumors. The most common GIT malignancies were adenocarcinomas, followed by hepatocellular carcinoma and squamous cell carcinoma as shown in Table 2. The liver is the most affected site of the GIT, followed by esophagus, stomach and colorectal. In lymph nodes (n=235) the non-Hodgkin's lymphoma 42%, was the most common malignant tumor, followed by Hodgkin's disease 21%, metastatic undifferentiated carcinoma 18%, metastatic squamous cell carcinoma 6%, metastatic adenocarcinoma 3%, metastatic thyroid papillary carcinoma 3% and others 7%. Head and neck malignancies (n=178) were mostly situated in the oral cavity 73%, followed by pharynx 16%, larynx 5%, salivary glands 5% and nose 2%. The most common cancer in the head and neck was the squamous cell carcinoma 65%, followed by undifferentiated carcinoma 14%, non-Hodgkin's lymphoma 11%, malignant salivary gland tumors 4.5%, adenocarcinoma 2% and others 4%.

**Discussion.** Male to female ratio was found comparable in this study, which is not different with information from other studies,<sup>10,11</sup> but contrary to that from the USA,<sup>9</sup> which may be due to different life style and health education. We think it implies the necessity for more health education and periodical examination of breast and cervix. With

regards to age; skin, GIT and male genital system malignancies affect older ages. In young age; bone marrow, CNS/eye and bone/soft tissue malignant tumors were the most frequent affected sites. A comparable finding was revealed from southeastern governorates<sup>4</sup> and the Kingdom of Saudi Arabia.<sup>10</sup> The GIT was the most common affected site, which is comparable with other studies.<sup>4,9,10-13</sup> Among GIT malignancies in the Republic of Yemen, liver was the most affected organ followed by esophagus, then stomach. Colorectal cancers ranked 4th. Adenocarcinoma was the most common cancer type among GIT malignancies, followed by hepatocellular carcinoma. Comparable findings were found in several studies in the Kingdom of Saudi Arabia.<sup>14-18</sup> Hepatitis B virus and hepatitis C virus infection are the main causative factor.<sup>14</sup> The high incidence of esophageal cancers in this study is comparable with that of the Kingdom of Saudi Arabia.<sup>10</sup> This result is most probably due to food intake habits in the region, such as too hot and spicy food.<sup>19</sup> The low incidence of colorectal cancers in Yemeni patients is comparable with Saudi and Omani patients<sup>10,11</sup> and in contrast to that in USA,<sup>9</sup> which may be due to different life style and dietary habits.<sup>20</sup> Lymph nodes were the 2nd common site of malignancies in our study, which is comparable with other studies.<sup>4,10,12</sup> Head and neck malignancies were 3rd in our study. In southeastern governorates they were 5th,<sup>4</sup> but less common in USA.<sup>9</sup> The increased abuse of shamma and kat in the Republic of Yemen was contributing to the high incidence of cancers in the oral cavity 73%.<sup>5,6,21</sup> The squamous cell carcinoma 65% was the most diagnosed cancer in the head and neck similar to that found in other studies in the Republic of Yemen<sup>5</sup> and in the Kingdom of Saudi Arabia.<sup>18,20</sup> Skin malignant tumors ranked 4th in this study comparable with that found in the Kingdom of Saudi Arabia.<sup>10,22</sup> Urinary tract malignancies constituted the 5th common cancer in the current work, which is comparable with that found in the USA,<sup>9</sup> but they are less common in other studies.<sup>4,10</sup> Bone and soft tissue malignant tumors were frequent in our study, especially among young age patients, similar to other studies.<sup>4,10</sup> Breast cancer among Yemeni women ranked first similar to other parts of the world.<sup>4,9,11,23,24</sup> Sex cases of breast cancers were diagnosed in male patients, 3 were true invasive ductal carcinomas and 3 were soft tissue malignant tumors. In a study conducted in Oman 6 out of 154 breast cancer patients were male patients.<sup>25</sup> Malignancies of the female genital system in our study ranked 8th, in the USA<sup>9</sup> 3rd. This result is most probably due to low acceptance of medical examination in our society. Thyroid gland cancers ranked 9th in our study, different from other studies<sup>4,9,23</sup> one half of the cases were papillary carcinomas similar to the finding of previous studies in the Republic of Yemen.<sup>7</sup> Finally, the cancers of male genital system, bone marrow and

CNS/eye were the least common in our study. Two 3rds of cancers of the male genital system were prostatic carcinomas. Leukemia and CNS eye malignant tumor were mostly in young age patients, similar to that found in other studies.<sup>4,10</sup>

In conclusion GIT in general with breast in females, were the most frequent sites of malignancies in the Republic of Yemen. Adenocarcinoma and squamous cell carcinoma were the most common cancer types. A national cancer registry is needed to make definitive preventive and therapeutic measures. Public awareness and health education especially for women can contribute towards prevention, early detection and better follow-up results.

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