Pattern of gynaecological malignancies in south western region of Pakistan: An overview of 12 years

HINA MANZOOR[1], HAMIDA NAHEED[1], KHUSHNASEEB AHMAD[1], SHEHLA IFTIKHAR[1], MUHAMMAD ASIF[2], JAMILA SHUJA[1], NEELAM SULTAN[3], IRFAN ALI[4], SYED INAYATULLAH[2] and YASIR HAYAT KHAN[5]

[1]Centre for Nuclear medicine and Radiotherapy (CENAR) Quetta 87300; [2]Department of Biotechnology, Balochistan University of Information Technology, Engineering and Management Sciences, Quetta 87300; [3]Department of Applied Chemistry and Biochemistry, Government College University, Faisalabad 38000; [4]Akhuwat-Faisalabad Institute of Research Science and Technology, Faisalabad 38000, Pakistan; [5]School of Life Sciences, Xiamen University, Xiamen, Fujian 361000, P.R. China

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Abstract. Gynaecological malignancies contribute significantly to cancer burden and have a higher rate of mortality and morbidity. The aim of this retrospective study was to determine the pattern of gynaecological malignancies identified between January, 2000 and December, 2011, at the Centre for Nuclear Medicine and Radiotherapy (CENAR). At CENAR 5,072 female patients were registered with different malignancies, of which 632 cases were gynaecological malignancies. Ovarian cancer (47%) was the most common gynaecological malignancy, followed by cervical cancer (29%), uterine cancer (14%), vulvar and vaginal cancer (6%), and gestational trophoblastic neoplasm (4%). Of the ovarian cancer cases, 72.5% had epithelial while 26.5% had non-epithelial cancer. Squamous cell carcinoma was 75.9% in cervix and 87.8% in vulva and vagina while endometrial carcinoma (75.9%) was more frequent in uterus. For gestational trophoblastic neoplasm, 69.2% of patients had choriocarcinoma. Ovarian cancer was the most common type for the age range of 50-59 years. In the case of cervical and gestational trophoblastic neoplasm the majority of patients presented at the ages of 40-49 and 30-39 years while uterus, vulvar and vaginal tumor presented in the elderly (>60 years). Thus, ovarian cancer is the leading gynecological malignancy in Pakistan.

Correspondence to: Dr Hina Manzoor, Centre for Nuclear medicine and Radiotherapy (CENAR), Building No. 01, Brewery Road, Quetta 87300, Pakistan
E-mail: asifjallali@yahoo.com

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Introduction

Gynaecological malignancies are those involving the genital tract and include those of the ovary, cervix, uterus, vulva, vagina and gestational trophoblastic malignancies. These malignancies are leading cause of cancer-related deaths (1).

The pattern of gynaecological malignancies differs in various geographical areas owing to different environment, life style, genetic pattern and socioeconomic background (2). Cervical cancer is one of the most common types of cancer in women after breast cancer (3). Approximately 80% of cervical cancer occurs in developing countries (4). In African and Indian studies, cervical cancer is the second most common type of cancer in women, following breast cancer (5,6). Cervical cancer is not considered the primary gynaecological malignancy in Pakistan; ovarian cancer is more common (7,8). Ovarian cancer has the highest mortality rate in developing countries because as two-thirds of the cases present at advanced stage (9).

A recent trends involves the shift of cancer burden from developing to underdeveloped countries (10). In the USA and Europe, cervical cancer is the most common type in women (11). Cervical cancer occurrence is related to the human papilloma virus (HPV). HPV infection is transmitted through sexual activity and the possibility of transmission is increased with early stage of initiation of sexual activity, multiple sexual partners and high-risk sexual partner (12). Cancer of the vagina is rare, constituting less than 2% of gynecological cancers. It accounted for 13,200 cases worldwide, with 9,000 presenting in developing countries. The disease primarily occurs in women older than 60 years of age. Cancer of the vulva constitutes 3% of gynaecological cancers (13). The highest prevalence of genital tract cancer in underdeveloped countries is due to lack of awareness, risky sexual behavior and absence of population-based screening procedure especially for cervical cancer (14).

The aim of the present study was to collect comprehensive information from the Centre for Nuclear Medicine and

Table I. Site distribution of gynaecological tumors (N=632).

Sr. No.	Site of tumor	No.	(%)
1	Ovary	295	47
2	Cervix	183	29
3	Uterus	87	14
4	Vulva and vagina	41	6
5	Gestational trophoblastic neoplasm	26	4

Radiotherapy (CENAR) on gynaecological malignancies. A retrospective analysis of gynaecological malignancies identified at CENAR over the last 11 years (January, 2000 and December, 2011) was carried out. A comparison was made of CENAR, Quetta, data with that available from other centers in Pakistan and worldwide.

Materials and methods

The records of all the patients of CENAR, Quetta, were retrospectively reviewed to identify any cases of gynaecological malignancies. Cases registered at CENAR, and treated in the Department of Oncology between January, 2000 and December, 2011 were considered. The clinical record of all the patients was reviewed with factors including name, age, sex and type of cancer. Results were presented as number and percentage.

Results

General. During the study period of January, 2000 and December, 2011, 5,072 female patients were registered at the Department of Oncology of CENAR with different malignancies.

Gynaecological malignancies were ranked the third most common tumor in females with a frequency of 632 (12.5%) patients followed by gastrointestinal tract tumor with 1,098 (21.6%) patients and breast cancer 993 (19.5%) patients.

Distribution of tumor sites. Table I shows that the most common female genital tract malignancy was ovarian cancer (47%). Of the ovarian malignancies, epithelial tumors were observed predominantly in 214 (72.5%) patients, followed by germ cell tumors in 49 (16.7%) patients and sex cord tumor in 29 (9.8%) patients. Mucinous adenocarcinoma was the most common histological type of epithelial ovarian cancer with 103 patients, followed by serous adenocarcinoma, 93 patients; endometrial adenocarcinoma, 16 patients; and clear cell carcinoma, 2 patients. Dysgerminoma was the most common histological type of germ cell tumor with 35 patients, 9 patients with teratoma, and 5 patients with ovarian choriocarcinoma. Granulosa cell tumor was the most common histological type of sex cord tumor with 29 patients.

Age distribution. Table II shows that ovarian cancer was more common within the age range of 50-59 years (23%) and also found before the age of 20 years (6%). The other sites of involvement include cervix (29%), uterus (14%), vulva and vagina (6%) and gestational trophoblastic neoplasm (4%).

Histological types. Table III shows that cervix was the main histological type of cancer, with squamous cell carcinoma observed in 139 (75.9%) patients, while 23 (12.6%) patients showed adenocarcinoma and 19 (10.4%) patients were affected with sarcoma. Uterus as the main histological type of cancer with endometrial tumor was found in 66 (75.9%) patients, followed by sarcoma in 19 (21.8%) patients. Adenocarcinoma was the most common histological type of endometrial tumor with 43 patients, while 14 patients were affected with papillary carcinoma, 9 patients with embroynal tumor and 19 patients with leiomyosarcoma. Of the vulvar and vaginal malignancies, squamous cell carcinoma was predominant in 36 (87.8%) patients, followed by adenocarcinoma in 4 (9.8%) patients. In gestational trophoblastic neoplasm, choriocarcinoma was observed in 18 (69.2%) patients, molar pregnancy in 5 (19.2%) patients, invasive mole in 2 (7.8%) patients and hydatidiform 1 (3.8%) patient. For cervical 56 patients (30%) and gestational trophoblastic neoplasm 14 patients (54%), the majority of the patients presenting comprised the 40-49 and 30-39 year age groups, respectively, while the uterus 30 patients (34%) , as well as the vulvar and vaginal 23 patients (56%) comprised the elderly groups (>60 years).

Discussion

The burden of gynaecological cancer is on the increase worldwide, but it is higher in developing than developed

Table II. Age-wise distribution of gynaecological tumors (N=632).

Age (years)	Ovarian cancer	Cervical cancer	Uterine cancer	Vulva end vagina cancer	Gestational trophoblastic neoplasm	Total	Percentage (%)
<20	19	1	-	-	3	23	4
20-29	52	3	8	-	6	69	11
30-39	42	20	11	2	14	89	14
40-49	61	56	14	7	2	140	22
50-59	67	52	24	9	1	153	24
>60	54	51	30	23	-	158	25

Table III. Histological types of gynaecological malignancies.

Tumor site	Type of tumor	No. (%)
Ovary	Epithelial	214 (72.5)
	Mucinous adenocarcinoma	103
	Serous adenocarcinoma	93
	Endometrial adenocarcinoma	16
	Clear cell	2
	Germ cell	49 (16.7)
	Dysgerminoma	35
	Teratoma	9
	Ovarian choriocarcinoma	5 (9.8)
	Sex cord	29
	Granulosa cell tumor	29 (1.0)
	Miscellaneous	3
Cervix	Squamous cell carcinoma	139 (75.9)
	Adenocarcinoma	23 (12.6)
	Sarcoma	19 (10.4)
	Miscellaneous	2 (1.1)
Uterus	Endometrial	66 (75.9)
	Adenocarcinoma	43
	Embroynal	9
	Papillary carcinoma	14 (21.8)
	Sarcoma	19
	Leiomyosarcoma	19
	Miscellaneous	2 (2.3)
Vulvar and vaginal	Squamous cell carcinoma	36 (87.8)
	Adenocarcinoma	4 (9.8)
	Miscellaneous	1 (2.4)
Gestational trophoblastic neoplasm	Choriocarcinoma	18 (69.2)
	Molar pregnancy	5 (19.2)
	Invasive mole	2 (7.8)
	Hydatidiform	1 (3.8)

countries, with approximately five million new cancer cases diagnosed annually (15).

In this study, ovarian cancer was the most common site of gynaecological tract malignancies which is comparable to other studies. It is also the leading site reported by other studies as ovarian cancer (30%) was found to be the most common gynaecological malignancy (16). The most frequent cancer was ovarian caner (48%), followed by cervical, endometrial cancer, gestational trophoblastic neoplasm (GTN) and vulvar cancer (17). Every year 10/100,000 females are diagnosed with ovarian cancer in Karachi, while in Lahore this cancer type is ranked fourth (18). A study conducted in Tehran reported that of 450 cases, the highest percentage was ovarian cancer (55.5%), followed by malignancies of the uterus (24.9%) and cervix (19.6%) (19). Of the ovarian malignancies, 72.5% of epithelial tumors were predominant, followed by germ cell tumors at 16.7% and sex cord tumor at 9.8%. Epithelial tumor was the most common type while the sex cord and germ cell tumor of ovary were less common (19). Mucinous adenocarcinoma was the most common histological type of epithelial tumor while dysgerminoma was a common malignant type of germ cell tumor and granulosa cell tumor a common malignant type of sex cord. Similar findings were observed in other studies (20,21). Results showed that the majority of ovarian cancer occurs in the 50-59 year age group. A similar finding was identified in another study in which ovarian malignancies were common within the 5th and 6th decades of life (22).

Ovarian cancer has the highest mortality rate among gynecologic cancers, even in developing nations (23). Late stage diagnosis requires long, complex, very aggressive and costly treatment; thus, the management of ovarian cancer in developing countries poses a great challenge (24).

In this study, cervical cancer ranked second of all the gynecologic malignancies, whereas international studies identified cervical cancer as ranking first in gynecologic malignancies. In Pakistani women, it is the second most common cancer type, with the majority of patients presenting at 15-44 years of age. Approximately 5,000 women are diagnosed with cervical cancer and approximately 3,000 succumb to the disease annually (3). Results also showed that cervical cancer is predominant in the younger age groups (40-49 years). For cervical cancer, the main histological type of cancer was squamous cell carcinoma, which is similar to a study performed in Nigeria in which squamous cell carcinoma was predominant (92%) (24).

Studies conducted in different parts of Pakistan showed that HPV is the major cause of cervical cancer among Pakistani women (25,26). HPV infection is transmitted through sexual contact (27). However, results of the CENAR center differ from international studies. This disparity can be attributed to differences in religious background affecting the sexual and reproductive behaviour of both male and female populations. A woman of this region (Pakistan) engages in monogamous relations thereby decreasing the likelihood of HPV-related infection and cervical cancer (16).

The incidence of cervical cancer is lower in Pakistan as compared to developed countries. Nevertheless, mortality is higher due to late diagnosis of cervical cancer (28). Late diagnosis occurs due to lack of a structural program for screening in Pakistan (29). A study performed on university students reported that 76.79% of university students were not aware of cervical cancer, 86.20% were unaware of cervical cancer symptoms and only 6.49% had knowledge regarding the Pap smear test for cervical cancer screening (27). Furthermore, only 5% of Pakistani women are aware of screening and only 2.6% performed the screening test once. These results indicate that even the educated population of Pakistan has no basic knowledge about HPV, cervical cancer and its screening test (30).

Uterine/endometrial cancer is the third most common site of gynecological tract malignancies with the majority of patients presenting in the older age groups (>60 years), which is comparable to other studies. Endometrial/uterine (23%) malignancy is the third most common site of gynecological malignancies and the majority of patients present in the older age groups (>60 years) (16).

These malignancies constitute the third leading site of malignancy in women after breast and ovary (31). Similarly,

one study from India reported that uteri (129 cases) are the third most common malignancy in the female genital tract after cervix (927 cases), and ovary (196 cases) (32). In uterus, the main histological type of cancer was endometrial tumor with 66 patients (75.9%), followed by sarcoma 19 (21.8%) patients. Adenocarcinoma was the most common histological type of endometrial tumor.

In this study, vulvar and vaginal cancer (6%) was the fourth most common site of gynaecological malignancies with a common age group (>60 years). In the United Kingdom, vulvar and vaginal cancer account for 7% of gynecological cancers diagnosed in women. Vulvar cancer rarely presents in Asia as compared to North America and Europe. Among the vulvar and vaginal malignancies, squamous cell carcinoma was predominant (87.8%), followed by adenocarcinoma (9.8%). Similarly previous findings showed that SCC is present in 73.61% of vulvar cancers and 61.25% of vaginal cancers (33).

Gestational trophoblastic neoplasm is the least common malignancy of gynecological malignancies, in the 30-39 years age group. In this study, it was the least common malignancy (4%); nevertheless, its percentage is significant if compared to hospital-based studies from other cancer centers of Pakistan (34-36). In those studies, diseases were more common in the reproductive age, which is comparable to the present study. The reason for the high frequency of the gestational trophoblastic neoplasm in this study as compared to other studies may be the fact that patients of CENAR had low socioeconomic and poor education status. A study reported that the highest incidence in Asia is generally due to low socioeconomic status and poverty (37). It is a disease that can be successfully treated as indicated by two different studies which showed that successful treatment was achieved in 97.6 and 91.3% patients, respectively, whereas 3.3 and 8.69%, respectively, succumbed due to extensive disease (metastasizing up to brain) and poor general health (34,35). Gestational trophoblastic neoplasm is successfully treated even in the presence of metastasis. The major risk factors for the disease include advanced maternal age and a past history of the gestational trophoblastic disease (38).

In the CENAR center, data collection concerning cancer management is poorly established because it is a complicated, multidimensional health issue. Consequently, due to lack of facilities its management it remains in the primary stages. The reason for the high frequency of gynaecological malignancies in this study may be the fact that women have little access to health care facilities, not taking decisions concerning their individual health, women's position in the family is assured with the birth of the child, especially a male child, lack of structural program for screening, poverty and low socioeconomic status. Due to a lack of facilities and financial resources, the screening program is not feasible in developing countries; as a result most patients present with advanced stage cancer. Prevention is the gold standard for reducing morbidity and mortality in advance stage gynecological malignancies for countries such as Pakistan, which have a rapidly growing population, poor resources and poverty. A more practical way for reducing late diagnosis of cancer in the country involves development of well-equipped specialized centres providing affordable treatment to reduce the burden of advanced stage cancer.

In conclusion, gynaecological cancer is the third most common malignancy among females registered and treated in the CENAR center. Ovarian cancer is the leading gynaecological malignancy. The most common age group for the different malignancies is comparable to other studies.

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