Original Article

Histopathological Variants of Ovarian Tumors; A Study of 701 Cases from a Tertiary Care Medical Centre in Sindh

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Abstract

Objective: To provide insight into the data of women presenting with ovarian malignancies and their various histopathological types in Sindh, the second most populated province of the country.

Methodology: Data on ovarian cancers were obtained from the pathology department of Liaquat University of Medical and Health Sciences from January 2014 to December 2017. Histopathological subtypes were classified according to the latest WHO classification into epithelial tumors, germ cell tumors, stromal tumors, and others. Further classification was carried out based on histological types, laterality, and age.

Results: A total of 701 cases of ovarian tumors were sent to the Histopathology Department of Liaquat University of Medical and Health Sciences during a four-year period from January 2014 to December 2017. The percentage distribution of all ovarian tumors was 542 (77.3%) for epithelial tumors, 129 (18.4%) for germ cell tumors, 25 (3.6%) for stromal tumors, and 5 (0.7%) for others. Out of the total cases, 609 (86.8%) were unilateral, while 92 (13.1%) involved both ovaries. In the age group ranging from 0-18 years, there were a total of 49 (7%) cases, including 43 benign and 6 malignant cases. In the 19-40 years' age group, there were 503 (71.6%) ovarian tumors with 38 malignancies. The category of 41-60 years' age group had 125 (17.8%) cases, including 83 benign ovarian tumors and 42 malignant tumors. There were 24 (3.4%) cases of ovarian tumors in the >60 years' age group, including 7 malignant tumors.

Conclusion: This study provides data on ovarian tumors studied in a tertiary care medical university over a four-year period in the Sindh province of Pakistan. The analyzed data could be utilized by provincial and federal governments to devise health policies, and it could be helpful for various health-oriented non-governmental organizations (NGOs) in allocating their funds towards creating awareness, sensitizing the masses, and screening the population in order to decrease the mortality and improve overall prognosis in a country where health facilities are already scarce.

Key Words: Ovarian cancer, Ovarian tumors, Benign ovarian tumors.

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Introduction

Ovarian cancer is a term referring to a group of malignancies that arise from or involve the ovary.[1] Ovarian cancer accounts for only 3% of all cancers in women, but it is the leading cause of death among gynecological malignancies.[2] Worldwide, it has been estimated that there were 295,414 new cases of ovarian cancer in 2018, with 184,799 deaths, making it one of the most common types of gynecological malignancies.[3] Ovarian cancer is the fifth leading cause of death from cancer among women in the USA. In 2018, it was estimated that there would be more than 22,000 (or more than 3% of all cancer diagnoses) cases of ovarian cancer in the USA, with a potential number of deaths exceeding 14,000.[4] Non-specific clinical symptoms and

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the absence of early biomarkers usually lead to late diagnosis, contributing to the poor prognosis and high mortality rate of ovarian cancer.[5] In children, ovarian tumors are relatively uncommon, accounting for 1.5% of all malignancies during childhood.[6]

From a morphological point of view, ovarian cancers are divided into two broad subtypes: epithelial ovarian cancers (EOC), which comprise 86-90% of all ovarian cancers, and non-epithelial ovarian cancers (NEOC), which make up the rest of the ovarian malignancies.[1] EOC has a poor prognosis due to diagnosis in advanced stages (stage III or IV) with distant metastases throughout the peritoneal cavity.[7-9] Unlike EOC, NEOC is diagnosed earlier, with the tumor confined to the ovary and no metastases.[10, 11]

In Asian pacific region including Pakistan, there is a low cancer survival rate due to lack of awareness about cancer, poor health facilities and socioeconomic conditions. According to a recent study, ovarian cancer is the second most common cancer after breast cancer among females of Punjab, the most populated province of the Pakistan.[12]

The present study has been conducted to provide data on ovarian tumors and their histopathological variants among females in Sindh, the second most populated province of Pakistan.

Methodology

Data of all ovarian tumors (histopathology reports & review blocks) were obtained from archival material of Pathology department of Liaquat University of Medical & Health Sciences, Jamshoro from January 2014 to December 2017. Various histopathological types of ovarian tumors were classified according to latest WHO classification into epithelial tumors, germ cell tumors, stromal tumors and others. Cases were further distributed according to their histological types, laterality and age. [13]

Results

The 4-year record of ovarian tumors comprised a total of 701 cases. Among all the cases, epithelial tumors formed the majority with 542 (77.3%), followed by germ cell tumors with 129 (18.4%), sex-cord stromal tumors with 25 (3.6%) cases, and miscellaneous ovarian tumors with 5 (0.7%) cases.

A total of 701 cases of ovarian tumors were sent to the Histopathology Department of Liaquat University of Medical and Health Sciences during a period of four years from January 2014 to December 2017 (Table I). All cases were distributed according to age group, laterality, and histopathological variants. The data were classified according to the WHO classification into epithelial tumors, germ cell tumors, sex-cord stromal tumors, and miscellaneous tumors (including secondary metastatic tumors). The percentage distribution of all ovarian tumors in the respective groups was 542 (77.3%), 129 (18.4%), 25 (3.6%), and 5 (0.7%).

Table I: Number of benign, malignant and borderline tumors in each category of ovarian tumors.

Epithelial Tumors:		
Serous Tumor		
Benign	Serous cystadenoma	**332**
Borderline	Serous borderline tumor	**02**
Malignant	Low grade/high grade serous carcinoma	**43**
Mucinous Tumor		
Benign	Mucinous cystadenoma	130
Borderline	Mucinous borderline tumor	04
Malignant	Mucinous carcinoma	**28**
Endometrioid Tumor		
Benign		0
Malignant		**01**
Brenner Tumor		
Benign		0
Malignant		0
Seromucinous Tumor		
Benign		**02**
Undifferentiated carcinoma		0
Sex-cord Stromal Tumors		
Pure stromal tumor	Fibroma	**03**
	Fibrosarcoma (M)	02
	Thecoma	01
	Fibrothecoma	01
	Sclerosing stromal tumor	01
	Leiomyoma	**01**
Pure sex cord tumor	Adult/Juvenile granulosa cell tumor	15
Sex cord stromal tumrs	Sertoli-Leyding cell tumor (SLCT) (M)	**01**
Germ Cell tumors		
Dysgerminoma (M)		06
Yolk sac tumor		0
Embryonal carcinoma		0
Mature teratoma/dermoid cyst		116
Immature teratoma (M)		02
Mixed germ cell tumor (M)		05
Monodermal Teratoma and Somatic type tumors arising from dermoid cyst		
Struma ovary		0
Carcinoid (M)	-	**01**
Others		
Lymphoid tumor	Lymphoma	
Secondary tumor (M)		03
Malignant mixed mullerian tumor (M)		**01**
Total		**701**

609 (86.8%) cases were unilateral whereas 92 (13.1%) cases involved both ovaries. 479 (88.4%) of epithelial

tumors were unilateral with remaining 63 (11.6%) bilateral ovarian tumors. Of 129 germ cell tumors, 106 (82.2%) were unilateral whereas 23 (17.8%) were bilateral cases. Among 25 cases of sex-cord stromal tumors, 23 (92%) were unilateral with 2 cases involving both ovaries. In the category of others, one secondary metastatic tumor was found to involve both ovaries.

Table II: Age-wise distribution of ovarian tumors with their biological behavior.

Age	Benign	Malignant
0-18 years	43	06
19-40 years	465	38
41-60 years	83	42
>60 years	17	07
Total Cases= 701 (100%)	608 (86.7%)	93 (13.3%)

Among 701 total cases that we analyzed, there were total 49 (7%) cases in the age group ranging between 0-18 years with 43 benign and 06 malignant cases (Table III). In 19-40 years' age group, there were 503 (71.6%) ovarian tumors with 38 malignancies. 125 (17.8%) cases fell in the category of 41-60 years' age group with 83 benign ovarian tumors and 42 malignant tumors. 24 (3.4%) cases of ovarian tumors were from > 60 years' age group with 7 malignant tumors.

Table III: Distribution of histopathologic variants of ovarian tumors based on their biological behavior and morphology.

Type of tumor	Benign	Malignant	Borderline	Total (%)
Epithelial tumors	464	72	06	542 (77.3)
Sex cord stromal tumors	22	03	-	25 (3.6)
Germ cell tumors	116	13	-	129 (18.4)
Others	00	05	-	05 (0.7)
Total	602 (85.6%)	93	06	701

Table IV: Total number of malignant cases in each subclass of ovarian tumors.

Type of tumor	Number of cases (%)
Epithelial Tumors	
Serous tumors	43 (46.2%)
Mucinous tumors	28 (30.1)
Endometrioid carcinoma	01 (1.1)
Sex cord Stromal Tumors	
Fibrosarcoma	02 (2.1)
Sertoli-Leydig cell tumor	01 (1.1)
Germ Cell Tumors	
Dysgerminoma	06 (6.45)
Immature teratoma	02 (2.1)
Mixed germ cell tumor	05 (5.37)
Others	
Carcinoid tumor	01 (1.1)
Mixed mullerian tumor	01 (1.1)
Secondary tumors	03 (3.22)
Total	**93**

Of total 701 cases of ovarian tumors, 602 (85.6%) were benign, 92 (13.1%) were malignant and 06 (0.86%) cases were borderline. Of 602 benign tumors, 551 (90.5%) were unilateral whereas 51 (8.5%) were bilateral. Among 93 malignant tumors, 69 (74.2%) were unilateral and 24 (25.8%) were bilateral. There were only 02 (33.3%) cases of borderline tumors involving both ovaries with 04 (66.7%) unilateral cases. Table IV presents the distribution of malignant ovarian tumors across different subclasses.

Discussion

Among all 701 cases, the most common benign tumor was benign serous cystadenoma (332 cases; 47.4%), followed by benign mucinous cystadenoma, comprising 18.5% (130 cases) of all 701 cases of ovarian tumors, and mature teratoma with 116 (16.5%) cases. These findings are consistent with the studies conducted by Gupta et al, Garg et al. Patil et al. and Modepalli and Venugopal (2016) (14-17). However, there is one study conducted by Mankar and Jain (2015) that reported mucinous cystadenoma (32.69%) as the most common benign ovarian tumor.[18]

In our study, among malignant tumors (93 cases; 13.3%), the most common malignant tumor was serous carcinoma, comprising 43 cases (46.2%). Out of the 6 borderline tumors, borderline mucinous tumor was the most frequent, with 4 cases. Similar findings have been reported in studies conducted by Gupta et al. Kanpurwala et al, Garg et al, and Modepalli and Venugopal.[14, 15, 17,19]

Regarding laterality, our study found 609 (86.8%) unilateral tumors and 92 (13.1%) bilateral ovarian tumors. Similar numbers have been reported in studies conducted by Gupta et al. (2019), Kanpurwala et al. and Venugopal.[16,18] The frequency of bilateral ovarian tumors reported by Garg et al. was considerably lower (4.7%), which could be due to the smaller number of cases (85) included in their study.

Our study, although represents data of a tertiary care medical centre, could be proved useful regarding ovarian tumors and its various histopathological variants as data encompass a reasonable period of four years. Besides, the study provides the common and uncommon variants of ovarian tumors prevalent in our ethnic population in a particular region. Furthermore, it also provides age-wise distribution of benign and malignant ovarian tumors (Table II) which indicates that ovarian tumors are more frequent during reproductive

life from 19-60 years of age. It also provides the researchers and consultants as to target women of this age-group in order to create an awareness regarding this fatal disease to achieve better overall prognosis. We believe all these and many other aspects of this study could be utilized by our healthcare providers and policy makers to devise health policies targeted at early diagnosis and creating public awareness among masses.

Conclusion

Ovarian cancers are often diagnosed at late stages, resulting in high mortality rates. Addressing this issue at both local and global levels is crucial. Collecting data on ovarian cancer can help shed light on the problem and contribute to the implementation of health policies aimed at early diagnosis. Screening programs targeting blood relatives of individuals diagnosed with ovarian cancer can be beneficial. It is important to consider appropriate approaches for early detection and treatment management. Establishing population-based cancer registration in representative areas of Pakistan is essential to improve our understanding of nationwide trends and the overall burden of cancer. This will enable better estimation, effective planning, and evaluation of cancer control initiatives in the country.

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