Original Article

Malignant Epithelial Ovarian Tumors

Evaluating the Age Related Frequency of Borderline and Malignant Epithelial Ovarian Tumors at a Tertiary Care Hospital in Karachi

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ABSTRACT

Objective: Malignant ovarian tumors are one of the most lethal malignancies. The incidence of ovarian cancer is highest in Pakistan among all South Asian countries. It is 90% curable disease when diagnosed with stage I. Unfortunately, this disease is usually diagnosed in advanced stages, when it becomes symptomatic due to the abdominal dissemination of tumor.

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted at the Department of Pathology, BMSI, JPMC, Karachi from January 2011 to December 2015.

Materials and Methods: The study material included 18 borderline and 84 consecutive samples of malignant epithelial ovarian tumors. The morphology was correlated with the age of the patients. The inclusion criteria were Properly fixed, paraffin embedded surgical pathological specimen with adequate tumor material.

Results: Nearly 267 histopathologicaly proven cases of epithelial ovarian tumors were received in above mentioned five years. Out of these tumors 18 (6.7%) cases were borderline and 84 (31.2%) were malignant. Mucinous borderline tumor was commonest borderline tumor (72.2%). Serous cystadenocarinoma was the commonest malignant epithelial ovarian tumor (51%). Borderline ovarian tumors were seen between 21-40 years, whereas most malignant tumors were seen above 40 years. The observations and results of the study were elaborated with the assistance of tables, figures and photomicrographs.

Conclusion: Malignant tumors out numbered the borderline ovarian tumors. The commonest borderline tumor was Mucinous borderline tumor. Among the malignant ovarian tumors, serous cystadenocarcinoma dominated the other types. Malignant ovarian tumors are more common above 40 years. Borderline tumors are commonly seen up to 30 years.

Key Words: Ovarian tumors, Serous cystadenocarcinoma, Borderline ovarian tumors, Tertiary Care Hospital.

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INTRODUCTION

Approximately 239, 000 cases of malignant ovarian tumors were recorded in 2012, accounting for nearly 4% of all new cases of cancer in women (2% overall). Ovarian cancer incidence rates are greater in middle- to low-income countries. In the year 2013, approximately 22,000 new cases were diagnosed and about 14,000 women died due to this disease in the United States[1].

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Incidence rates are 11.7 per 100,000 in the UK, 8.0 per 100, 000 in the US, 5.2 per 100 000 in Brazil and 4.1 per 100,000 in China[2]. Ovarian cancer is the 3rd most common malignancy in Pakistan[3]. The newly diagnosed case rate is 10.2 per 100,000 in a year, while in India it is 1.2 per 100,000 per year. The reason for high rates of ovarian cancers in Pakistan is still unknown. Probable risk factors are lifestyle and reproductive factors, but the most common cause is the genetic susceptibility [(4)]. More than four epithelial cell layers are the sign of malignancy and in case of borderline tumors the stromal micro-invasion up to 5 mm in any single focus and noninvasive peritoneal implants are acceptable [(5)].

During the process of repair the ovarian surface epithelium in invaginated in the underlying stroma. Which forms the inclusion cysts and finally cause the serous ovarian cancer. Endometrioid and clear cell carcinomas are associated with retrograde endometriosis, while mucinous and transitional (Brenner) tumors arise from transitional-type epithelial

nests at the tubal-mesothelial junction by a process of metaplasia[6].

The present study was designed to find out the frequency of different histological types of borderline and malignant epithelial ovarian tumors and to analyze the age distribution of these tumors.

MATERIALS AND METHODS

This study was conducted at the Department of Pathology, BMSI, JPMC, from Jan. 2011 to Dec. 2015.

Material

- Relevant clinical and lab data received in surgical pathology request forms
- Paraffin embedded blocks
- Clinical records
- Haematoxylin and eosin stained slides.

Method

- All relevant clinical information and the data were recorded on designing proforma.
- Hematoxylin and eosin staining was performed.
- All the slides were studied under light microscopy using a scanner (4x), low power (10x), and high power (40x) lenses and were also reviewed by supervisor.

Data was entered and analyzed using SPSS (Statistical Packages of social sciences) version 21. The Mean was computed from age. Frequency and percentage were calculated for the histological type of the tumors.

RESULTS

Table No.1: Distribution of Various Morphological Types of Ovarian Epithelial Tumors (n=267):

Benign Tumors	Borderline Tumors	Malignant Tumors
167 (62%)	18 (6.7%)	84 (31.2%)

Table No.2: Distribution of Various Morphological Types of Borderline and Malignant Epithelial Ovarian Tumors.

Morphological Types	Borderline Tumors (N=18) (6.7%)	Malignant Tumors (N=84) (31.2%)
Serous	4 (22.2%)	43 (51%)
Mucinous	13(72.2%)	`20 (23.8%)
Seromucinous	1 (5.5%)	
Endometroid adenocarcinoma		9 (10.71%)
Clear cell carcinoma		2 (2.38%)
Signet ring carcinoma		1 (1.19%)
Mixed Mullerian tumors		1 (1.19%)
Poorly differentiated tumors		6 (7.1%)
Undifferentiated tumor		2 (2.38%)

During the study period from January 2012 to December 2015, 267 consecutive cases of epithelial ovarian tumors were selected. Table 1: Shows the distributions of 267 ovarian surface epithelial tumors.

Table 2: Shows the distribution of various histological types including serous, mucinous, Endometroid, Poorly differentiated and other tumors.

Table No.3: Age Distribution and Mean Age of Borderline and Malignant Epithelial Ovarian Tumors:

Tumor Type	No of Cases	12-20 Years	21-30 Years	31-40 Years	41-50 Years	51-60 Years	>61 Years	Mean Age
Borderline Tumors	18	3 (16.6)	4 (22.2)	4 (22.2%)	3 (16.6%)	3 (16.6%)	1 (1.25%)	37 Years
Malignant Tumors	84	4 (4.7%)	11 (13%)	20 (23.8%)	30 (35.7%)	13 (15.4%)	6 (7.1%)	44 Years

Table 3: Shows distribution of ovarian tumors in different age groups. In Borderline tumors, the incidence age observed was 18 to 65 years..

DISCUSSION

The present study aimed at determining the frequency and distribution of borderline and malignant epithelial ovarian tumors in Jinnah Postgraduate Medical Center, Karachi a tertiary care hospital.

The total numbers of epithelial ovarian tumors were 267. The borderline tumors were found to be 6.7% out of all the epithelial ovarian tumors in the current study. Amongst these, 72.2% cases constituted mucinous borderline tumors and 22.2% cases were serous borderline tumors. A single case (5.5%) of seromucinous borderline tumor was found. These results were comparable to Danish et al (2012) who found 3.3% borderline tumors among all ovarian tumors and Sarkar et al (2015) reported 5.88% among all epithelial ovarian tumors. In contrary, an Egyptian study by Mostafa et al (2015) observed 12.9% Borderline tumors. The low percentage of borderline tumors in our population may be due to the late presentation of the disease because this is a nonsymptomatic disease in early stages.

In the current study borderline ovarian tumors were commonly seen in the 4th decade of life with 37 years mean age. Much higher mean age of presentation is observed by Sarkar et al (2015) who reported 43 years of presentation in his study.

Total number of malignant epithelial ovarian tumor cases was 84 which was 31.2% among all surface epithelial tumors and 4.1% of all malignant cases diagnosed during the above mentioned period. This figure was almost identical to a study conducted in Shaukat Khanum Memorial Cancer Hospital and Research Center (SKMCH & RC) Lahore by Bader (2015) and Bhurgri et al (2011) who found 3.9% and 4.0% respectively.

Serous cystadenocarcinoma was the commonest among all surface epithelial ovarian carcinomas, constituting

51%. Mucinous cystadenocarcinomas (23.8%) were the second most prevalent type of tumor, Endometroid adenocarcinoma (10.71%) was the 3rd most commonly observed tumor. While, cases of poorly differentiated (7.1%), Clear cell carcinoma, undifferentiated tumors (2.38% each), Mixed müllerian carcinoma (1.19%), and Signet ring adenocarcinoma (1.19%) were also seen. These numbers correspond to Khan and Sultana (2010) who found 54% cases of serous cystadenocarcinoma and 22% mucinous cystadenocarcinoma and 10.6% cases of Endometroid adenocarcinoma in their studies.

This observation was almost in accordance to the results of a Korean study by Jung et al (2013) who described serous cystadenocarcinoma as the most common histological subtype accounting for 40.5%. The second most common epithelial origin malignancy was Mucinous cystadenocarcinoma (17.78%), 16.88% of Endometrial carcinoma, 18.33% Clear cell carcinoma, 1.88% Mixed Müllerian tumors and 0.91% undifferentiated carcinoma.

In an Indian study by Saini et al (2016) Serous cystadenocarcinoma (49.69%) was the commonest and endometrial adenocarcinomas 19.1% were found to be the second most common epithelial ovarian malignancy, Mucinous cystadenocarcinoma 10.42% and Clear cell 4.29%. The reasons for the slightly low percentage could be due to the environmental and genetic factors, keeping in view that cousin marriages are not seen in Indian culture.

According to Kurman et al (2011) WHO Classification of ovarian tumors, Mixed Müllerian tumors are included in Epithelial ovarian cancers and are composed of ovarian epithelial component and mesenchymal component comprising of skeletal muscle cartilage or bone.

The mean age for presentation of ovarian epithelial carcinoma was 44 years in this study and observed to be more common in the 5th decade of life corresponding to Leide et al (2002) who reported 46.6 years mean age. Jamal et al (2006) reported 46.5 years mean age of ovarian cancers in specimens received in Armed Forces Institute of Pathology. These results were also closer to the observed age of Bhurgri et al (2011) giving 45 years, mean age and 45.8 year according to Sharma et al (2014).

In contrast Khan and Sultana (2010) reported 51 years and Saini et al (2016) reported 55 years of mean age in their respective studies.

An International study by Feltmate et al (2014) described peak age of 75to 79 years ranging from 50 to 75 years. Another study by Doufeks and Olatin (2014) described 63 years mean age and a lower incidence in the women under the age of fifty in the United Kingdom. Similar study also focused on the environmental and genetic factors as a possible reason for a decrease percentage of these tumors in Western countries. According to Mostafa et al (2015), higher percentage of positive family history of ovarian malignancies is the major cause of increased incidence in early age in Pakistan.

CONCLUSION

The current study concluded that epithelial ovarian tumors are more common in our population. Borderline tumors were observed in younger age patients, mostly below forty years of age. The malignant tumors were more prevalent in 5th and 6th decades of life.

Author's Contribution:

Concept & Design of Study:	Shaista Gul
Drafting:	Syed Muhammad Ishaque, Humera Shehzad
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Revisiting Critically:	Shaista Gul, Syed Muhammad Ishaque
Final Approval of version:	Shaista Gul

Conflict of Interest: The study has no conflict of interest to declare by any author.

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