DOI: https://doi.org/10.53350/pjmhs22168176

ORIGINAL ARTICLE

Morphological Types of Epithelial Origin Ovarian Tumours

HADIA NAZAR[1], KHEEM CHAND LOHANO[2], ASHOK KUMAR[3], ARUNA KUMARI HIRA[4], AZRA IDRIS[5], LATA BAI LOHANO[6], AAYAT ELLAHI[7]

[1]*Department of Pathology, Jam Ghulam Qadir Teaching Hospital Hub, Balochistan*
[2]*Department of Pathology, Sindh Government Lyari General Hospital, Karachi*
[3]*Department of Pathology, Sindh Government Qatar Hospital, Karachi, Sindh*
[4]*Department of Gynaecology, Dow University of Health Sciences, Karachi, Sindh*
[5]*Department of Pathology, Sir Syed College of Medical Sciences, Karachi, Sindh*
[6]*Gynaecologist, Taj Medical Complex, Karachi, Sindh*
[7]*Department of Community Medicine, Jinnah Sindh Medical University*
Correspondence to Dr. Hadia Nazar, kiran.abbas@scholar.aku.edu

ABSTRACT

Aim: To assess the various morphological types of epithelial origin ovarian tumors.
Methods: The study involved cases that were presented to the Pathology department between January 2015 to December 2020. Epithelial ovarian tumors that were diagnosed as either benign, borderline, or malignant were analyzed. The inclusion criteria involved pathological specimens of ovarian tumors consisting of cells that are epithelial in origin. Clinical records, ultrasounds, and histopathological investigations of the patients were accessed from the hospital database for analysis.
Results: A total of 309 cases were reviewed. Out of these, ovarian epithelial tumors made up at least four-fifths of the total tumors i.e. 258(83.5%). Non-epithelial origin of ovarian tumors only consisted of 51(16.5%) cases. Out of these 153(49.84%) cases were diagnosed as serous, 88(28.48%) as mucinous. A total of 175(61.4%) tumors were benign, 15(5.81%) were borderline, and 68 (26.3%) were malignant. The patients with malignant serous tumors (43.24±13.99 years) were considerably older than individuals with benign (34.54 ± 13.16 years) and borderline (32.71±13.79 years) serous tumors.
Conclusion: The present study concludes that epithelial ovarian cancer is the most commonly encountered lesion in our population. Benign and borderline tumors involve slightly younger age groups, mostly below forty years of age.
Keywords: Carcinoma, Epithelial-origin tumors, malignancy, ovarian tumors

INTRODUCTION

Ovarian cancer is the tumor with the most unfavorable prognosis and a leading cause of death from the gynecological tumor (Koshiyama et al., 2014). Ovarian cancer ranks 18th among the top diagnosed cancers overall and 7th most common malignancy of the female genital tract worldwide[1].

Although ovarian tumors appear in adverse ways and usually cannot be detected until they attain a large size. Hormonal, environmental, and genetic factors play an important role. It has been suggested that a large proportion of ovarian cancers originate from surface epithelium or postovulatory inclusion cyst, formed after follicular rupture and repair, and generate an appropriate environment for ovarian cancer development[2].

Strong family history of tumors involving the ovaries and breasts, and women who have tested positive for an inherited mutation in breast cancer gene (BRCA1) or (BRCA2) genes are at a much greater risk. Some other risk factors are polycystic ovarian syndrome, late menopause, nulliparity, estrogen-only hormone replacement therapy, Infertility, smoking, early menarche, high-fat diet, etc. Pregnancy, lactation, tubal ligation, hysterectomy, salpingectomy, and a diet rich in vegetables and fruits decrease the risk[3,4].

With respect to the parent cells, the tumor is derived from, ovarian carcinomas can be classified as Surface epithelial tumors, germ cell tumors, and sex cord-stromal tumors. Around 65% of all ovarian cancers derive from the surface epithelial cells, which may either have a benign, borderline, or malignant biological behavior, Benign ovarian tumors include Serous and Mucinous cystadenoma and Brenner tumor. Borderline ovarian tumors are serous, mucinous, and seromucinous borderline tumors. Malignant ovarian tumors are serous, mucinous, endometrioid, clear cells, and transitional cell tumors. Germ cell tumors make up 15% of all ovarian tumors and are derived from oocytes. These include Teratoma, Dysgerminoma, endodermal sinus tumors, and choriocarcinoma. 10% of ovarian tumors are sex cord-stromal tumors which are composed of the cells derived from granulosa or theca stromal cells[4].

Received on 11-03-2022
Accepted on 27-07-2022

Due to the scarcity of local literature, the present study was undertaken to evaluate the spectrum of ovarian tumors of epithelial origin.

MATERIALS AND METHODS

A cross-sectional study was undertaken at a tertiary care hospital between January 2015 to December 2020. A non-probability convenience sampling technique was employed to recruit the cases. Ethical approval from the Institutional Review Board (IRB) Committee was obtained before initiating the study. All epithelial ovarian tumors that were diagnosed as either benign, borderline, or malignant were included in the study. The study included pathological specimens of ovarian tumors consisting of cells that were epithelial in origin. The samples were fixed and embedded in paraffin. Cells that were not derived from the epithelium or tumors that were metastatic were excluded from our study.

Clinical records, ultrasounds, and histopathological investigations of the patients were accessed from the hospital database for analysis after obtaining permission from the respective departments. Ovarian tumors of epithelial origin were further classified in terms of the degree of epithelial multiplication and tumor invasion and the histological type of the cells that make the tumor. In our study, the ovarian tumors were classified as either benign, malignant, or borderline. Each group was identified using the newest available guidelines. Benign epithelial ovarian tumors, such as adenomas and cystadenomas, were identified by the absence of active cell division and invasion into the periphery. On the other hand, malignant tumors were described as cells that actively divide, with features of nuclear atypia and invasion into the surrounding stroma. Borderline ovarian tumors appeared to have proliferating cells with mild nuclear atypia in the absence of invasion into the stroma.

SPSS was used to analyze the data. For continuous variables, mean and standard deviation were determined. Categorical variables were presented as raw numbers and percentages. A Chi-square test was applied to ascertain the association between independent and dependent variables. A p-value of < 0.05 was set as the statistical cut-off for significance.

RESULTS

A total of 309 cases were reviewed. Out of these, ovarian epithelial tumors made up at least four-fifths of the total tumors i.e. 258 (83.5%). Non-epithelial origin of ovarian tumors only consisted of 51 (16.5%) cases (Table 1). 153 (49.84%) cases were diagnosed as serous, 88 (28.48%) as mucinous, three cases were diagnosed as an endometrioid, signet ring, and Brenner tumor, respectively. Two cases were diagnosed as clear cell carcinoma, while six were poorly differentiated and six were seromucinous tumors. Table 2 shows the distribution of morphology according to the grade of the tumors. It was found that there were a total of 175(61.4%) benign cases, 15(5.81%) borderline, and 6826.3%) were malignant. Association was explored between age in different types of epithelial ovarian tumors and morphology of the tumors (Table 3). The patients with malignant serous tumors (43.24±13.99 years) were considerably older than individuals with benign (34.54±13.16 years) and borderline (32.71±13.79 years) serous tumors. Similarly, patients with malignant mucinous ovarian tumors had a mean age of 44.11±15.73 years which was almost ten years older than the benign and borderline tumors of mucinous morphology (Table 3). Upon assessing the association between the grade of the tumor and morphology, it was found that the serous morphology was significantly associated with a higher grade (p<0.0001) (Table 4).

Table 1: Distribution of ovarian tumor according to origin (n=258)

Types of Ovarian Tumors	N (%)
Ovarian epithelial tumors	258 (83.5%)
Non-epithelial origin ovarian tumors	51 (16.5%)

Table 2: Distribution of morphological types of epithelial ovarian tumors

Morphology	Borderline			Total (n=258)
	Benign	Borderline	Malignant	
Serous	124 (70.86%)	7 (46.67%)	22(32.35%)	153 (49.84%)
Mucinous	50 (28.57%)	8 (53.33%)	30(44.12%)	88 (28.48%)
Seromucinous	0 (0%)	0 (0%)	1 (1.47%)	1 (0.32%)
Endometrioid carcinoma	0 (0%)	0 (0%)	6 (8.82%)	6 (1.94%)
Clear cell carcinoma	0 (0%)	0 (0%)	2 (2.94%)	2 (0.65%)
Signet ring carcinoma	0 (0%)	0 (0%)	1 (1.47%)	1 (0.32%)
Brenner tumor	1 (0.57%)	0 (0%)	0 (0%)	1 (0.32%)
Poorly differentiated	0 (0%)	0 (0%)	6 (8.82%)	6 (1.94%)

Table3: Distribution of of epithelial ovarian tumors according to age range.

Morphology	Borderline			Total (n=258)
	Benign	Borderline	Malignant	
Serous	34.54±13.16	32.71±13.79	43.24±13.99	35.73±13.59
Mucinous	35.52±14.97	37.29±14.03	44.11±15.73	38.72±15.51
Seromucinous	-	-	45±9.54	45 ± 9.54
Endometrioid carcinoma	-	-	47.5±5	47.5±5
Clear cell carcinoma	-	-	45±7.07	45±7.07
Signet ring carcinoma	-	-	22±7.1	22±7.1
Brenner tumor	50±3.2	-	-	50±3.2
Poorly differentiated	-	-	47.33±13.14	47.33±13.14

Table 4: Distribution of ovarian tumors according to histological grades.

Morphological types	Histological grades			P value
	Grade 1	Grade 2	Grade 3	
Serous	10(47.62%)	0	12(52.38%)	0.001
Mucinous	11(35.71%)	12(39.29%)	7 (25%)	0.49

DISCUSSION

The present study was designed to determine the frequency and distribution of epithelial-origin ovarian tumors in Jinnah Postgraduate Medical Center, Karachi, a tertiary care hospital. In the present study, 309 total cases of ovarian tumor were received over five years, out of which 258 (83.5%) were diagnosed as surface epithelial origin ovarian tumors. Our findings are in agreement with various studies that reported frequency of epithelial origin ovarian tumors is high as compared to nonepithelial origin ovarian tumors. Our results were close to Khan (2017) Bhurgri (2011) and Yasmeen (2008) who found 80%, 90%, 78.4%, and 76.5% cases respectively.[5–7] Similar observations were made in Indian studies by Mankar (2015) who reported 69.75%, Kancherla (2017) who found 80% and ModePalli (2016) reported 90% of epithelial origin ovarian tumors[8–10]. Narang (2017) showed a similar frequency (74.06%) of epithelial-origin ovarian tumors in the Journal of Pathology Nepal[11].

In our study, most cases were benign accounting for 67.8% cases. Our results correspond to the study by Ahmad (2000) who reported 60% benign tumors and Junejo (2010) who gave a statistic of 64.5%.[12,13] The frequency of Sohail (2012) and Arshad (2015) was also the same in 70.9% and 66.1% cases respectively.[4,14] The commonest benign tumor in this study was of Serous type 70.9%, followed by Mucinous cystadenoma 28.6% and a single case of benign Brenner tumor 0.6%. Our findings are comparable to Zubair (2015) found 67% of cases of benign ovarian tumors out of which 78.2% cases were of Serous cystadenoma while benign Brenner tumor accounts for 0.59%[15]

In the current study, 68 cases of epithelial-derived metastatic ovarian tumors were identified, which was 26.29% among all surface epithelial origin ovarian tumors. These findings compare well with Ahmad (2000) who reported 37.5% of malignant epithelial origin ovarian tumors at Aga Khan University hospital[12]. Junejo (2010) found 27.2% cases of metastatic epithelial-derived ovarian tumors, while Sohail (2012) noted 27.9% cases and Arshad (2015) reported 33.9% such cases[4,13,14]. A fairly identical percentage of 32.3% was reported by Zubair (2015) Armed Forces Institute of Pathology. Arab (2010) in an Iranian study, Endometrioid carcinoma was the most prevalent tumor 77%, and Clear cell carcinoma 40% was the second most common tumor. The differences in percentage may be due to genetic, racial, and ethnic differences[15].

The present study was limited by small undiversified sample size and the unavailability of immunohistochemical analysis. Therefore, the findings of the current study cannot be generalized to a larger population. Future multicenter studies with a diversified sample population are recommended.

Funding Statement & conflict of interest: Nil

REFERENCES

1. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. Int J cancer. 2015;136(5):E359-86. doi:10.1002/ijc.29210
2. Koshiyama M, Matsumura N, Konishi I. Recent concepts of ovarian carcinogenesis: type I and type II. Biomed Res Int. 2014;2014:934261. doi:10.1155/2014/934261
3. Iqbal R, Hussain A, Intsar A. One-year review of cases of ovarian malignancy at Fatima Memorial hospital. Pak J Med Heal Sci. 2013;7:1134–6.
4. Arshad M, Niazi S. Frequency and histological spectrum of malignant ovarian tumors at King Edward Medical University, Lahore. Biomed. 2015;31:269.
5. Yasmin S, Yasmin A, Asif M. Clinicohistological pattern of ovarian tumours in Peshawar region. J Ayub Med Coll Abbottabad. 2008;20(4):11–3.
6. Khan M, Shah H, Qayyum A, Khan E. Histopathologic pattern of ovarian tumors in various age groups. J Postgr Med Inst. 2017;31.
7. Bhurgri Y, Shaheen Y, Kayani N, Nazir K, Ahmed R, Usman A, et al. Incidence, trends and morphology of ovarian cancer in Karachi (1995-2002). Asian Pac J Cancer Prev. 2011;12(6):1567–71.
8. Mankar D, Jain G. Histopathological profile of ovarian tumours: A twelve year institutional experience. Muller J Med Sci Res. 2015;6(2):107–11. doi:10.4103/0975-9727.160675
9. Modepalli N, Venugopal SB. Clinicopathological Study of Surface Epithelial Tumours of the Ovary: An Institutional Study. J Clin Diagn Res. 2016;10(10):EC01–4. doi:10.7860/JCDR/2016/21741.8716
10. Kancherla J, Kalahasti R, Sekhar K, Yarlagadda S, Devi S. Histomorphological study of ovarian tumors: an institutional experience of 2 years. Int J Sci Study. 2017;5:232–5.
11. Narang S, Singh A, Nema S, Karode R. Spectrum of ovarian tumours- a five year study. J Pathol Nepal. 2017;7(2):1180–1183. doi:10.3126/jpn.v7i2.18002
12. Ahmad Z, Kayani N, Hasan SH, Muzaffar S, Gill MS. Histological pattern of ovarian neoplasma. J Pak Med Assoc. 2000;50(12):416–9.
13. Junejo N, Shaikh F, Mumtaz F. Clinical presentation and treatment outcome of ovarian tumors at gynecology ward. JLUMHS. 2010;9:30.
14. Sohail I, Hayat Z, Saeed S. A comparative analysis of frequency and patterns of ovarian tumors at a tertiary care hospital between two different study periods (2002-2009). J Postgr Med Inst. 2012;26:196–200.
15. Zubair M, Hashmi SN, Afzal S, Muhammad I, Din HU, Hamdani SNR, et al. Ovarian Tumors: A Study of 2146 Cases at AFIP, Rawalpindi, Pakistan. Austral Asian J Can. 2015;14:21–6.