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Original Article

Study of Histopathological Pattern and Frequency of Ovarian Tumors in Western Region of India: A Study at Tertiary Care Centre

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Abstract

Objective: The objective of the study was to study and analyze the various histopathological pattern and age distribution of ovarian neoplasms.

Materials and Methods: This is a study of ovarian neoplasm at tertiary care hospital over a period of 5 years. A total of 308 ovarian lesions were studied. Specimens were received in formalin, and hematoxylin and eosin stained slides were examined.

Results: Out of 308 total ovarian lesions studied, 100 (32.46%) were found neoplastic lesions. Out of which 88% were benign, 4% borderline and 8% were malignant. Except four cases, all 96 cases were unilateral neoplasms. Benign neoplasms were more common than borderline and malignant neoplasms in all age groups.

Conclusion: All kind of neoplastic lesions were most common in 20–59 years of age. Mature cystic teratoma was the most frequent neoplasm observed.

Key words: Dermoid cyst (mature cystic teratoma), Mucinous tumors, Ovary, Serous tumors

INTRODUCTION

Ovary is an important organ as it is concerned with the production of progeny. The ovary consists of sex cells and mesenchymal cells which are totipotential and multipotential, respectively. Hence, when it becomes neoplastic, almost any types of tumor can result.[1] A number of non-neoplastic and neoplastic lesions occur within the ovaries. They can present from the neonatal age to post-menopause. Most are functional in nature and fade away with minimal treatment. However, ovarian cysts can herald an underlying malignant process. When cysts are large, persistent, or painful, surgery may be required.[2] Detection of various histological patterns of ovarian tumors is very important in diagnosis, prognosis as well as treatment of ovarian tumors. Prognosis of the tumors can also be predicted from the degree of differentiation of the tumors.[2]

Ovarian tumors are insidious in onset and usually diagnosed at a late stage. They commonly present with abdominal pain, a lump or menstrual irregularities. In addition to biopsy, various diagnostic modalities include transvaginal ultrasonography, magnetic resonance imaging, positron emission tomography, and markers like serum CA-125.[3]

Diverse histopathologies are common in ovarian lesions. Relative frequency of different ovarian tumors is different for the Western world and Asian countries.[3]

It is a well-established fact that neoplastic conditions of ovaries form a complicating and baffling subject in the history of oncology. The neoplasm arising from it inherits a spectrum of histogenetic background, much more varied than any other.[1] Early diagnosis is difficult due to its asymptomatic nature, inaccessible site and the limited use

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of various techniques such as cytology and biopsy. Thus, ovarian neoplasm offers a good field for research.

The understanding of the molecular pathogenesis of ovarian cancer has been hindered by the lack of sufficient number of specimens at the early-stage disease. As a result, identifiable precursor lesions that ultimately develop into ovarian cancer are still debatable.[4]

In the ovary, the problem is further complicated by the endocrine activities of tumor causing a variety of clinical symptoms and signs, and some feminizing ovarian tumors are associated with endometrial carcinoma. Further, ovary is a target organ for a variety of hormones from menarche to menopause and repeatedly undergoes involutions thereby giving rise to tumor formation.[5]

This prospective study is carried out in the Pathology Department of this institute. The purpose of this study was to see the frequency and pattern of ovarian tumors in our setup and compare it with the pattern reported within the country and abroad.

Table 1: Distribution of class of neoplasms of ovary

Neoplasm of ovary	Number of cases (%)
Epithelial tumors	
Serous cystadenoma	27 (27)
Mucinous cystadenoma	15 (15)
Serous cystadenofibroma	01 (01)
Borderline serous cystadenoma	02 (02)
Borderline mucinous cystadenoma	02 (02)
Serous cystadenocarcinoma	03 (03)
Mucinous cystadenocarcinoma	01 (01)
Endometrioid carcinoma ovary	01 (01)
Germ cell tumor	
Dermoid cyst	40 (40)
Struma ovarii	01 (01)
Immature teratoma	01 (01)
Dermoid cyst with sarcoma	01 (01)
Sex cord stromal tumor	
Fibroma-thecoma	04 (04)
Metastatic carcinoma	01 (01)
Total	100 (100)

Table 2: Distribution of neoplasms of ovary

Neoplasms of ovary	Number of cases (%)
Benign	88 (88)
Borderline	4 (4)
Malignant	8 (8)
Total	100 (100)

MATERIALS AND METHODS

A prospective case - series study was carried out on 308 specimens of ovary retrieved by surgical oophorectomy, cystectomy, and hysterectomy. Samples were analyzed in the Pathology Department of GMERS Medical College, Ahmedabad, Gujarat, for the period of 5 years from 2012 to 2016.

All the cases of ovary specimen sent for histopathological examination were included in the study. Clinical details were provided along with the specimen by the Obstetrics and Gynecologic Department of the same hospital.

The specimens were received in 10% neutral buffered formalin, processed and Hematoxylin and Eosin staining done. Gross and Microscopic findings of these cases were analyzed.

Neoplastic lesions from representative sections were studied and classified according to the World Health Organization classification, and staging is done according to International Federation of Gynaecology and Obstetrics staging.

RESULTS

Out of 308 total ovarian lesions studied, 100 (32.46%) were found neoplastic lesions.

Table 1 shows distribution of class of neoplasm of ovary. Dermoid cyst is most common tumor of the ovary.

Out of 100 cases studied, 88% were benign, 4 % borderline and 8% were malignant [Table 2]. Except four cases, all 96 cases were unilateral neoplasms. Benign neoplasms were more common than borderline and malignant neoplasms in all age groups [Table 3].

Amongst 100 cases of neoplasms of ovary studied during study period, percentage distribution of epithelial tumor is highest (52%) [Figure 1].

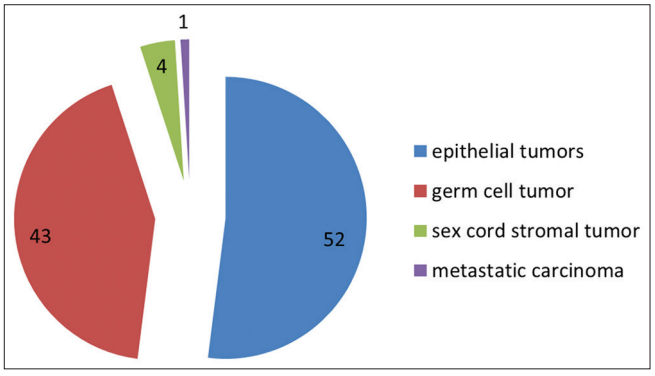

Figure 1: Percentage distribution of type of neoplasm of ovary

Table 3: Age distribution of cases of neoplasms of ovary

Neoplasm of ovary	Age in years									
	0–9	10–19	20–29	30–39	40–49	50–59	60–69	70–79	>80	total
Serous cystadenoma			7	6	9	2	1	2		27
Mucinous cystadenoma			5	2	4	3	1			15
Serous cystadenofibroma							1			1
Borderline serous cystadenoma				1	1					2
Borderline mucinous cystadenoma			1	1						2
Serous cystadenocarcinoma					2	1				3
Mucinous cystadenocarcinoma						1				1
Endometrioid carcinoma of ovary			1							1
Dermoid cyst	0	3	15	10	8	3	1			40
Struma ovarii							1			1
Immature teratoma				1						1
Dermoid cyst with sarcoma				1						1
Fibroma-thecoma		1		1	1		1			4
Metastatic carcinoma				1						1
total	0	4	29	24	25	10	6	2	0	100

DISCUSSION

Ovarian lesions appear with a variety of clinical appearance and behavior. Histopathological examination of them very essential to know the type and pattern based on the origin, which is a key for management.

In the current study, 308 ovarian specimens were received, 100 (32.46%) lesions were found to be neoplastic. Except four cases, each of mature cystic teratoma, serous cystadenoma, borderline serous cystadenoma, metastatic carcinoma, all of them were unilateral.

In the current study, 88% were benign, 4% borderline and 8% were malignant [Table 2] which correlates with various studies done in Saudi Arabia,[6] Pakistan,[7] and South India[8] by Abdullah and Bondagji.[6]

Ovarian tumor may occur at any age but incidence, however, increases with age, with highest cases being diagnosed in 3rd to 5th decade of life [Table 3]. In the present study, youngest patient was of 17 years old and eldest of 72 years.

The most common histopathological category of ovarian neoplasm is epithelial tumor followed by germ cell tumors [Table and Figure 1]. The most common benign tumor was mature cystic teratoma followed by serous cystadenoma. However, Guppy *et al.* documented a higher incidence of epithelial tumors than in our study, i.e., 90% and no borderline tumor was found in Ameena *et al.* study. This difference may be due to sample size, but genetic, socioeconomic and environmental factors may also be involved.[3]

The most common benign tumor is mature cystic teratoma [Table 1] which is comparable with a study by Ahmed *et al.*[9] showing 35.17 %, Mansoor,[10] Thanikasalam *et al.*,[11] and Ong and Chan.[12]

Serous tumors were found to be more common than mucinous tumors. Which is comparable with study done in India,[8,13] Egypt,[2] and Pakistan.[14] The frequency of malignant tumors was highest for serous cystadenocarcinoma followed by malignant germ cell tumor. This correlates well with studies done in India,[8] Pakistan,[14,15] and Nepal[16] having serous cystadenocarcinoma with the highest frequency.

Some molecular and histological evidence suggests that mucinous epithelial ovarian cancers build up through a sequence from benign tumor through the borderline tumor to invasive cancer which suggests the potential preventability of borderline and invasive mucinous ovarian cancer by surgical excision of identifiable precursor lesions.[2] The borderline tumors characterized by epithelial proliferation greater than that of the benign tumor more than two layers and <4 layers stratification, but there is no destructive invasion of the stroma.[2] In our study, we encountered 4 cases of ovarian borderline tumor which correlates well with Gupta *et al.*[17]

Most of the tumors were found during 20–51 years of age in present study similar to study done in our neighboring country Nepal,[18] Epithelial tumors are hardly seen in children, but their prevalence increases with age and peaks in the 4th and 5th decade of life.[2] We found no case of epithelial neoplasm in the 1st and 2nd decade of life. Borderline ovarian tumors are of low malignant potential having favorable prognosis and r elatively early age at onset. They comprise 4%–14% of all epithelial ovarian neoplasms.[2]

In the present study, we observe total 8 (8%) cases of malignant neoplasms.

This study shows the prevalence of ovarian malignancy of 12.5% in the age group between 3rd decade of life and 87.5% in 4th–6th decade of life which is comparable to study by Abdullah and Bondagji.[6]

Germ cell tumors whether benign or malignant found more commonly in below 50 years age groups.

The sex cord stromal tumors are not so common. The incidence of these tumors is variable in different studies. These tumors are of interest because of their hormonal effects which are rare with another ovarian neoplasm. In the present study, it is 4% correlates with Shaikh *et al*.[19] (5.03%) and Khan *et al*.[20] (5.15%).

Relative frequency of different ovarian tumors is different for the Western world and Asian countries. For example, surface epithelial tumors account for 50.0–55.0% of all ovarian tumors and their malignant counterpart for approximately 90.0% of all ovarian cancers in the Western world whereas this figure is 46.0–50.0% and 70.0–75.0%, respectively, in Japan. Similarly, mucinous tumors account for 12.0–15.0% of all ovarian tumors in the Western world. This figure is 20.0–23.0% for Japan. Germ cell tumors account for 30.0% of primary ovarian tumors, and malignant germ cell tumors account for 3.0% of all ovarian cancers in the Western world.[14]

Japanese women have reported a lower incidence of ovarian cancer, especially of epithelial type than US or European women. Approximately 90% of all the ovarian tumors are benign. Ovarian carcinoma represents the sixth most common female cancer and the fourth leading cause of death due to cancers in women.[7]

CONCLUSION

Diversity of ovarian pathologies creates challenges in research of timely diagnosis and management.

Histopathological examination of the ovarian tumor is necessary to find out the type and staging of tumor, which helps in the proper management of ovarian neoplasm.

These findings may contribute significantly in the understanding of the distribution of different ovarian neoplasms among our population in comparison with different regions of India and other Asian as well as the Western world, which may help to define the risk factors. Multicentric study with larger sample size for better understanding is recommended for future.

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