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Research Article

Analysis of spectrum of ovarian tumours: a study of 55 cases

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ABSTRACT

Background: Malignant epithelial tumours are the most common ovarian cancers and also the most lethal gynaecological malignancies. This study was undertaken to analyse histomorphological spectrum and clinicopathological correlation of ovarian tumours.
Methods: This retrospective study was done for the period of one year at Department of Pathology, New Civil Hospital, Surat, which is a tertiary health care center. Here we studied 55 cases of ovarian mass received in formalin, which were subjected to histopathological examination and immunohistochemistry as and when required.
Results: In total, 55 ovarian tumour specimens were examined. Out of which 28 cases (51%) were benign, 3 cases (5%) were borderline and 24 cases (44%) were malignant. Most common histological type was surface epithelial tumours (60%) followed by germ cell tumours (13%). The commonest benign tumour was mucinous cystadenoma and commonest malignant tumour was serous adenocarcinoma. Malignancy was quite common in ovarian masses in our institute.
Conclusions: Ovarian tumours are quite common in our set up and epithelial tumours are the commonest variety of ovarian tumours. The histological type of ovarian tumour correlates with the prognosis of the tumour.

Keywords: Ovarian tumours, Histological types, Malignancy

INTRODUCTION

In most of the population based cancer registries in India, ovarian cancer is the third leading site of cancer among women trailing behind cervix and breast cancer. The age adjusted incidence rates of ovarian cancer vary between 5.4 and 8 per 100,000 populations in different parts of the country.[1] Ovarian neoplasms affect a significant number of female population and has the worst prognosis among all gynecological malignancies. These tumours behave in a diverse way and generally escape detection until they attain a larger size. Diversity in histological patterns of ovarian tumours is important in diagnosis, treatment as well as prognosis. Laterality of the tumour also indicates their nature e.g. Sex cord stromal tumours are almost always confined to a single ovary while few of the epithelial tumours and metastasis are bilateral. And metastasis is also common in ovarian mass. In this study, we tried to find out frequency of different histopathological patterns of ovarian tumours in our region and their correlation with various clinical parameters.

METHODS

This retrospective study was done for a period of one year at Department of Pathology, New Civil Hospital, Surat. Here we studied 55 cases of ovarian mass specimen received in formalin and were subjected to histopathological examination (H & E stain) and IHC stains (p53, WT1, CK-7, CK-20, SMA, Vimentin, EMA, ER-PR, PLAP)for further subtyping whenever required.

Detailed case history was taken with clinical examination data and we studied correlation of histopathological patterns with age, bilaterality, morphology, grading of the tumour and metastatic spread.

RESULTS

Table 1: Distribution of ovarian neoplasms according to histological type.

Type	Number	Percentage
Surface epithelial tumour	33	60
Germ cell tumour	7	13
Sex cord stromal tumour	3	5
Others	12	22
Total	55	100

A total number of 55 cases were studied. Age of the patient ranged from 13-75 years. Mean age was 40 years and median age was 42 years with peak in 4th decade. In our study of 55 cases, 28 cases (51%) were benign, 3 cases (5%) were borderline and 24 cases(44%) were malignant. About 2/3 of the benign tumours were seen in less than 40 years of age whereas 2/3rd of all malignant tumours were seen after the age of 40 years.

Table 2: Distribution of surface epithelial tumours

Type of tumour	Number	Percentage
Serous tumours	9	27
Benign	1	11
Borderline	-	
Malignant	8	89
Mucinous tumours	16	49
Benign	7	44
Borderline	3	19
Malignant	6	37
Endometrioid Carcinoma	3	9
Brenner tumour(Malignant)	1	3
Transitional Carcinoma	1	3
Clear Cell Adenocarcinoma	1	3
Poorly differentiated carcinoma	2	6
Total	33	

Thirteen percent (7 cases) of all ovarian neoplasms were bilateral out of which five cases were malignant, one case each of benign and borderline tumour.

Distribution of ovarian neoplasms according to histological type

Out of 55 total cases, histologically commonest tumours were surface epithelial tumours (60%), followed by germ cell tumours (13%) than sex cord stromal tumours (5%) and rest (22%) (Table 1).

Distribution of surface epithelial tumours

Among 33 surface epithelial tumours, majority were malignant (22 cases), rest were benign (8 cases) and very few borderline (3 cases).

On further sub classifying the surface epithelial tumours, 16 cases (49%) were mucinous tumours, 9 cases (27%) were serous tumours, 3 cases (9%) were endometrioid carcinoma, 2 cases (6%) of poorly differentiated tumours and one case (3%) each of malignant Brenner tumour, transitional cell carcinoma and clear cell adenocarcinoma (Table 2).

Germ cell tumours were next in descending order. They constituted 7 cases (13%) of the total number. Among these, five were mature cystic teratoma, one case each of immature teratoma and dysgerminoma. Neoplasm from sex cords and stromal elements were 3 cases (5%), all of which were fibroma.

Krukenburg's tumour (metastatic deposits) was found in one (1.8%).

Miscellaneous and rare tumours were also observed and included fibromatosis, primary ovarian leiomyosarcoma and simple benign ovarian cyst.

IHC Findings

Undifferentiated Carcinoma with foci of High grade Serous Papillary Adenocarcinoma expressed WT1 and p53 and were immunonegative for CK-7, CK-20. Clear Cell Adenocarcinoma expressed CK (diffuse & strong positivity), EMA and were immunonegative for WT-1. Leiomyosarcoma expressed Vimentin, SMA, and Desmin (focally positive) and were immunonegative for ALK-1, CK, S-100, CD-68, and Myogenin. Fibromatosis expressed Vimentin, SMA (focal) and were immunonegative for CD117, CD34, and Desmin.

DISCUSSION

Ovarian tumours may remain unnoticed for a long period of time because of their anatomical location. These tumours cause abdominal pain and abdominal distension in majority of the cases.[2]

The exact nature of the ovarian tumour cannot be confirmed preoperatively just by clinical examination. Transvaginal ultrasonography has been recommended by the National Institute of Health as a preferred means of

diagnosis.[3] Ultrasonography has demonstrated usefulness in the detection of ovarian cancer in asymptomatic women, but its value for the detection of early stage epithelial ovarian cancer in women of increased risk is uncertain.[4] The microscopic appearance of the tumour is a must to find the histopathological pattern upon which further management rests.

Table 2: Distribution of surface epithelial tumours

Tumour type	Ahmed et al.(2000)[5]	Pilli et al. (2002)[6]	Gupta et al.(2007)[7]	Swamy et al. (2010)[8]	Naseer et al.(2007)[9]	Present study
Benign	59.18%	75.2%	72.9%	71.6%	68.7%	51%
Borderline	0.2%	2.8%	4.1%	3.3%	1%	5%
Malignant	40.81%	21.8%	22.9%	25.1%	31%	44%

Based on histological pattern, these tumours are divided into benign, borderline and malignant. This is true for all the primary morphological variants. The common variants are epithelial cell tumours, germ cell tumours and sex cord stromal tumours. The ovary is also the common site to get metastatic deposits from other abdominal cancers.

In the present study, most affected age group was 40-50 years which is comparable with other studies.

In the present study, 28 (51%) were benign, 3 (5%) were borderline and 24 (44%) were malignant tumours. This data is almost similar to data from Ahmed et al. study in Pakistan. However, figures of studied carried out in India by Pilli et al. and Gupta et al. showed results of benign ovarian tumours 75.2% and 72.9% respectively (Table 3).

Among histopathological patterns the commonest category of the ovarian tumours encountered in our series was surface epithelial tumours followed by germ cell tumours. This observation is consistent with other studies.[5,6,10] The most common benign tumour was mucinous cystadenoma followed by mature cystic teratoma.

Some molecular and histological evidences suggest that mucinous epithelial ovarian cancers develop via a sequence from benign tumour, through borderline tumour to invasive cancer which suggests the potential preventability of borderline and invasive mucinous ovarian cancer by surgical excision of identifiable precursor lesions.[11]

Immunohistochemical stain helps for confirmation of diagnosis and also for prognosis.

IHC is used to differentiate high grade and low grade serous tumours. p53 is expressed in high grade tumours and its expression is associated with poor prognosis.[12]

It is now accepted that high grade and low grade serous carcinoma are fundamentally different tumour types. Low grade serous carcinoma is associated in most cases with serous borderline component and carries KRAS and BRAF mutation. In contrast, high grade serous tumours are not associated with serous borderline tumours and typically exhibit TP53 mutation and BRCA abnormalities.

The histopathological type of ovarian tumour correlates with the prognosis of the tumours. Role of histopathology is critical in recognizing the distinct patterns of ovarian tumours as they have different epidemiological and genetic risk factors, precursor lesion, patterns of spread, response to chemotherapy and prognosis. Whether the malignant tumour arises de novo or the benign tumour transforms into malignant is the subject of on-going debate and research.

It is concluded from this study that on morphological grounds, tumours originating from surface epithelium are the commonest variant. We have observed an increased incidence of malignancy in our set up because patients usually present in advanced stages of disease, and this is an alarming finding. Based on the results of this study it is evident that early diagnosis is crucial to help in decreasing morbidity and mortality among these patients. It is therefore, suggested that efforts must be made to identify the risk factors for malignancy.

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