Histopathological Spectrum pf Ovarian Neoplasms in a Tertiary Care Hospital

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ABSTRACT

Introduction: Ovarian cancer accounts for about 3% of all cancers in women and is one of the leading causes of mortality among all cancers of female genital tract. Incidence rate was 10.2/100,000 females in India in 2013. Study aimed to record the histopathological spectrum of ovarian neoplasms over a period of 1 year in a tertiary care hospital.

Material and methods: This retrospective study was done for a period of 1 year (April 2017 to march 2018) in the Department of Pathology, Assam Medical College and Hospital, Dibrugarh. Here we studied 70 cases of ovarian mass specimen received and fixed in 10%formalin. 4-5micrometer thick sections were cut on microtome and stained by H and E stain for Histopathological Examination

Results: In this study, 70 cases of ovarian neoplasms were analysed. Out of these, 68 were primary and 02 were metastatic tumours. Amongst the primary ovarian tumours, 52 were benign, 5 were borderline and 11 were malignant. Histopathologically, surface epithelial tumours were the commonest (36), second most common was germ cell tumour (27) followed by sex cord stromal tumours (5). Benign tumours were common in 21-30 years of age, borderline tumours in 61-70 years of age and malignant tumours in 41-50 years age group.

Conclusion: Ovary is a common site of neoplasia in the female genital tract and usually presents with a variety of clinicomorphological and histological features. 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 alarmig finding

Keywords: Ovarian Neoplasms, Benign, Malignant.

INTRODUCTION

Ovarian cancer is the 5thmost common malignancy among women and the 2ndmost common gynaecological malignancy. It is the most common cause of death due to malignancy of female genital tract. Ovarian malignancies constitute about 25% of malignant tumours of the female genital tract.[1-4]

The incidence of ovarian carcinoma is greater in high income countries compared to middle and low income countries. In 2012, approximately 239,000 cases were recorded, which account for nearly 4% of all new cases of carcinoma in women (2% overall). Around the world, the incidence rate of ovarian carcinoma is 11 per 100,000 in Central and Eastern Europe, 5 per 100,000 in Africa, 11.7 per 100,000 in the US, 5.2 per 100,000 in Brazil, and 4.1 per 100,000 in China.[2]

In India, the ovarian cancer incidence (age-adjusted rate per 100,000) in different population-based cancer registries is reported to range from 1.7 to 15.2 for the year 2012 to 2014. An increasing trend of this cancer has been observed since 1982 to date. The projected number of cases for this cancer in India for 2015 and 2020 are 45,231 and 59,276, respectively.[5]

In Dibrugarh district, ovarian cancer is the 4th (8.9%) most common malignancy among females during 2012-2014. The respective Crude Rate (CR) and Age Adjusted Rate (AAR) per 100,000 population for the same are 6.0 and 6.5.[6]

These tumours behave in a diverse way and generally escape detection until they attain a larger size. Natural history and response to treatment vary considerably from one group of tumours to another. As there are no screening tests for ovarian tumours and these tumours cannot be confidently distinguished from one another on the basis of their clinical, radiological or gross characteristics, it is important to determine the histological pattern of ovarian tumours to achieve the optimum treatment response as prognosis depends on the degree of differentiation.[1]

Study aimed to find out the histopathological spectrum of ovarian neoplasms (both benign and malignant) over a period of one year in Assam Medical College and Hospital, Dibrugarh.

MATERIAL AND METHODS

This retrospective study was done for a period of 1 year (April 2017 to march 2018) in the Department of Pathology, Assam Medical College and Hospital, Dibrugarh. Here we studied 70 cases of ovarian mass specimen received and fixed in 10%formalin. For proper fixation, tumours were cut serially at 1cm thickness. After fixation for 24 to 48 hours, sections were given from representative areas. Minimum of four sections from the tumour were taken. 4-5micrometer thick sections were cut on microtome and stained by H and E stain for Histopathological Examination. Detailed

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case history was taken with clinical examination data and we studied correlation of histopathological pattern with the tumours and classified as per WHO classification of ovarian tumours.

RESULTS

A total number of 68 cases of primary ovarian tumours were studied (2 being metastatic). Benign tumours were common in 21-30 years of age, borderline tumours in 61-70 years and malignant in 41-50 years of age group (table-1,2).

Distribution of ovarian neoplasms according to histological types

Histopathologically, epithelial tumours were the commonest (36), second most common were germ cell tumours (27), followed by sex cord stromal tumours.[5]

Distribution of surface epithelial tumours

Amongst 36 surface epithelial tumours, 14 were malignant, 05 borderline and 15 benign On further sub classifying, there were24 serous tumous,10 mucinous tumours and 02 Brenner tumour.

Germ cell tumours were next in descending order. They comprised of a total of 27 cases. Among these, 24 of them were mature cystic teratoma or dermoid cyst, one case each

Type	Number	Percentage
Epithelial Tumours	36	53
Germ Cell Tumour	27	40
Sex Cord Stromal Tumour	5	07
Total	68	100

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

Type of tumour	Number	Percentage
Serous Tumour		
Benign	08	11.7
Borderline	05	7.3
Malignant	11	16.1
Mucinous Tumour		
Benign	07	10.2
Borderline	00	00
Malignant	03	4.4
Brenner Tumour	02	2.9

Table-2: Distribution of surface epithelial tumours

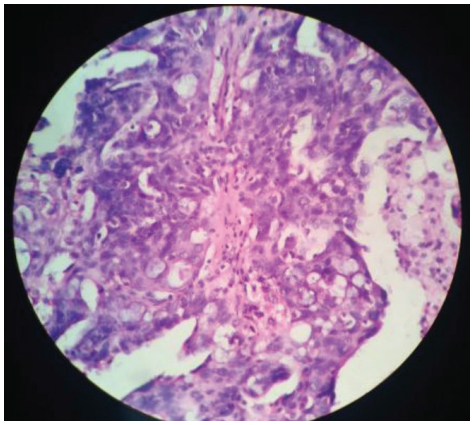

Figure-1: High Grade Serous Papillary Adenocarcinoma, 40X

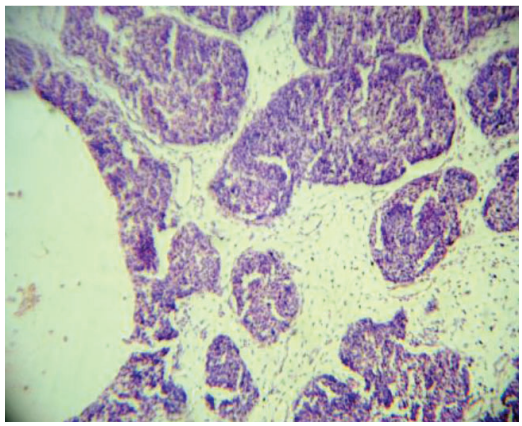

Figure-2: Borderline Brenner 10x

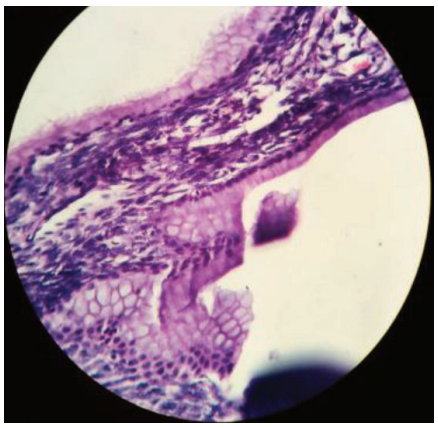

Figure-3: Mucinous cyst adenoma 10X

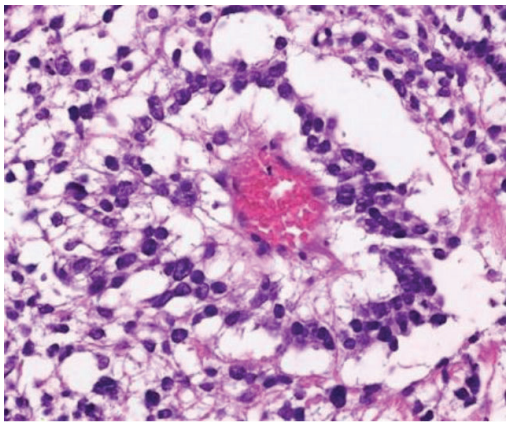

Figure-4: Schiller-Duval body, 40x

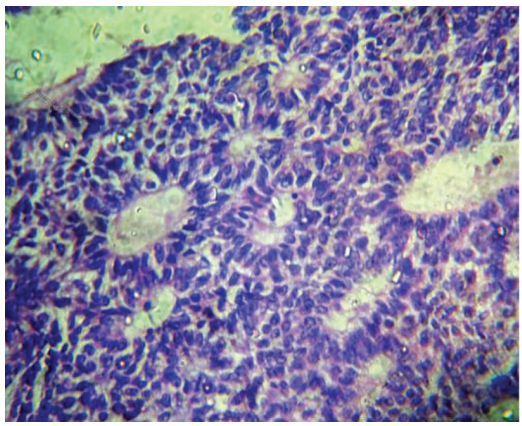

Figure-5: Granulose cell tumour, 40X

of Dysgerminoma and Mixed Germ Cell tumour and 1 case of Yolk Sac Tumour (Table 2). Sex cord stromal cell neoplasms were 5 in number, 2 cases each of Granulosa cell tumour and Fibroma and one case of Sertoli cell tumour.

DISCUSSION

Ovary is subjected to monthly endocrine and traumatic insults during normal ovulatory cycles and becomes susceptible to tumorogenesis.[7] The concept of a fallopian tube origin for high grade serous carcinomas arose initially from studies on women with BRCA1/2 germline mutations who were discovered at the time of prophylactic salpingo-oophorectomy to have areas of marked epithelial atypia in their fallopian tubes. The lesions, called serous tubal intraepithelial carcinoma(STIC), have since been described in association with spontaneous high grade serous carcinoma arising from the fallopian tube. A recent alternative hypothesis is that the cysts arise from implantation of detached fallopian tube epithelium at sites where ovulation has disrupted the surface of the ovary.[4]

Repeated ovulatory rupture and repair theoretically creates opportunities for malignant gene mutations. This may explain the apparent protective effect of oral contraceptives, late menarche, early menopause, multiparity and breast feeding. Each of these factors decreases the occurrence of ovulation.[8] Although no age group is free from the tumours, different tumours tend to involve different age groups preferentially. The complex anatomy of the ovary and its peculiar physiology with the constant cyclical changes from puberty to menopause give rise to number of cell types, each of which is capable of giving rise to tumours. Both primary and secondary tumours of the ovary are relatively frequent showing a variety of histopathological patterns.[9]

Nulliparity, family history of cancer and genetic mutations are some of the risk factors associated with the development of ovarian neoplasms although not much is clear about the risk factors involved in this neoplasm as compared to other genital tumours.[10]

Ovary is the second most common site for female cancers next only to breast and is associated to highest mortality rate. This is mainly due to the fact that these neoplasias manifest at a very late stage either stage III or IV and hence carry a poor prognosis. USG/CT/MRI can be misleading sometimes and cytology has its own limitations.[11] The histopathological type of ovarian tumour correlates with the prognosis as well. Hence histopathological diagnosis remains the mainstay in achieving an optimum treatment response.[12]

WHO classification of ovarian tumours is based on the tissue of origin of the tumours which have been found to arise from one of the three ovarian components- (1) epithelium, (2) the germ cells and (3) the stoma of the ovary.

The vast majority of ovarian tumours are benign and these occur mostly in young women between the age of 20-45 years.[13] In our study 60% of the tumours were benign, mature cystic teratoma or dermoid cyst being the commonest, constituting about 70% of the benign ovarian neoplasms.

In our study, majority of the cases were epithelial tumours. This observation is consistent with other studies. They constitute about two-third of all ovarian tumours.Epithelial tumours have traditionally been thought to derive from the epithelium that normally lines the outer aspect of the ovary, variously referred to as surface, coelomic or germinal epithelium.[14]

Out of the epithelial tumours, serous tumours constitute 30-40% and are common in the 4-5th decade. In our study, 24 cases were serous tumours, out of which 11 were malignant, 5 borderline and 08benign.

Next is mucinous tumour, which constitutes 20-25% of all ovarian tumours. Most of these tumours are usually unilateral multilocular cystic masses containing viscous mucoid material.[15] In our study, we found10 cases of mucinous tumour, out of which 7 were benign and 3 malignant. They occur principally in the middle adult life and are rare before puberty and after menopause. Mucinous tumours are known to produce large cystic masses. In our study mucinous tumours as large as (20x15cm) were found. All the cases found in our study were unilateral tumours. No borderline tumours were found.

Transitional cell tumours contain neoplastic epithelial cells resembling urothelium and are usually benign. They comprise roughly 10% of ovarian epithelial tumours and are also referred to as Brenner tumour.[10] In our study we found one case each of Borderline Brenner in a 65 year old lady presenting with a pelvic mass and a benign Brenner in a 38 year old lady.

Microscopically, in the borderline Brenner, there were nests of proliferating epithelial cells, mainly of transitional type embedded in the fibrous stroma. No stromal invasion was present (figure 1-3).

Germ Cell Tumours

Germ cell tumours constitute 15 to 20% of all the ovarian tumours. Most of them are benign cystic teratomas, found mostly in children and adults.[9]

In our study, we found 24 cases of mature cystic teratoma or dermoid cyst in the age group of 15-35years.

Grossly, these tumours were unilocular cysts containing tuft of hair and sebaceous material. Some of them also showed areas of calcification and these were mostly enclosed within an opaque, gray-white wrinkled epidermis.

Microscopically, the cyst wall is composed of stratified squamous epithelium with underlying sebaceous gland, hair follicles, calcifications etc.

These are predominantly benign tumours with a very rare incidence(1%) of undergoing malignant transformation.[10]

Dysgerminoma

Dysgerminoma is the ovarian counterpart of testicular seminoma. It accounts 2% of ovarian cancers and roughly 50% of malignant ovarian germ cell tumours.[4] In our study we found 1 case of dysgerminoma in a patient aged 24years, who presented with abdominal distension.

The gross specimen was about 6x7cm in size and the cut surface was solid, grayish white, soft and fleshy.

Microscopically, the tumour cells were present in sheets

separated by scant fibrous stroma which were infiltrated by lymphocytes. Like seminoma, the cells were large, vesicular having a clear cytoplasm, well defined cell boundary and centrally placed nucleoli.

Yolk Sac Tumour/ Endodermal Sinus Tumour

Yolk sac tumour is the second most malignant tumour of germ cell origin. It is thought to be originating from malignant germ cells that are differentiating along the extraembryonic yolk sac lineage.[9]

In our study we found one case of yolk sac tumour in a year old female. She presented with abdominal pain and a rapidly growing mass. AFP was raised and hCG was negative.

The gross specimen was 10 X 8 X 6cms in size, smooth and glistening external surface, cystic cut surface with hemorrhage and necrosis.

On microscopic examination, pathognomonic Schiller-Duval bodies were seen, which is a glomerulus-like structure composed of a central blood vessel enveloped by tumour cells within a space that is also lined by tumour cells (figure-4).

Mixed germ cell tumour

During our study period, we found one case of mixed germ cell tumour,in a 40 year old patient, comprising of dygerminoma and yolk sac tumour as its component

Sex cord- stromal tumours

These ovarian neoplasms are derived from the ovarian stroma which in turn is derived from the sex cords of the embryonic gonad.4

In our study we encountered 5 such cases, 2 cases each of Fbroma and Granulosa cell tumour and one case of Sertoli cell tumor.

Granulosa cell tumour

In our study we found a case of granulose cell tumour in a 45year old female who presented with post menopausal bleeding and abdominal pain.

Microscopically, there were small,cuboidal to polygonal cells growing in anastomosing cords and sheets. There was also the presence of characteristic Call-Exner bodies which are gland-like structures filled with acidophilic material (figure-5).

CONCLUSION

Ovary is a common site of neoplasia in the female genital tract and usually presents with a variety of clinicomorphological and histological features. However, benign tumours are far more common than their malignant counterparts with epithelial tumours being the commonest, followed by germ cell tumours. 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 alarmig 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.

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