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Clinico-histopathological spectrum of ovarian tumors in tertiary care center rajahmundry

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ABSTRACT

Background: Globally ovarian tumor is one of the leading causes of cancer death among women. It can present in childhood to postmenopausal age group and accounts for the most prevalent cause of hospital admissions. Ovarian tumor has varied histogenesis, clinical behavior and malignant potential.
Aim and Objectives: This study was done to analyse the frequency of ovarian lesions, their clinico-histological features in a tertiary care center.
Materials and Methods: Retrospective hospital based study conducted in the department of Obstetrics & Gynecology, GSL medical college from December 2019 to December 2020. All the relevant clinical data of patients who were treated surgically for suspected benign lesions of ovary were analysed from hospital record file.
Results: Of the 82 cases, 63 cases: benign (51.6%), 4 cases: borderline (3.28%), 15 cases: malignant(12.3%). Serous cystadenoma is most commonly seen benign tumor. Serous cystadenocarcinoma was commonly seen malignant tumor. Younger age group primarily presented with benign tumors whereas malignant tumors were common in elderly age group. Malignant ovarian tumors most commonly seen in nulliparous.
Conclusion: Surface epithelial tumors were the commonest ovarian tumor. Most commonly seen in the age group of 40-59yrs. Maximum numbers of malignant ovarian tumors were in the age range of >50yrs.

1. Introduction

Ovarian tumor is the seventh leading cause of cancer death (age standardized mortality rate: 4/100,000) among women worldwide and in India it is comprising up to 8.7% of cancers in different parts of the country.[1,2] Majority of them are benign, usually seen among 20-45yrs age group, malignant is seen among 40-65 yrs. Among Indian women, ovary is the third most common primary malignancy of female genital tract.[3]

The ovaries are paired intra-pelvic organ of female reproductive system involved with many important functions in the body. The ovary consists of sex cells and mesenchymal cells which are totipotential and multipotential respectively. So when it becomes neoplastic, almost any varieties of tumor can result.[4]

The main function of the ovary is to produce ova to implant after fertilization in the endometrium. It also functions as an endocrine gland in the development of secondary sexual characters as well as their maintenance. Thus ovary is always in a dynamic state.[3]

Important etiological risk factors are increasing age, positive family history, increase age of reproduction, high socio-economic classes, nulliparity.[5] The increased risk of ovarian cancer particularly of surface epithelial tumors (SETs) is associated with the use of hormone replacement

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therapy (HRT), tobacco consumption, family history of ovarian cancer and breast cancer, and mutation of BRCA1 and/or BRCA2 genes.[3]

The protective factors are use of oral contraceptive pills (OCPs) and multiparity not only in the general population but also significantly reduces the risk in BRCA1/BRCA2 carriers. Women between 40 to 59 years of age who have taken oral contraceptives for long duration or undergone tubal ligation have reduced risk of developing ovarian cancer comparatively.[3]

It is the most fascinating tumor of the woman in term of its histogenesis, clinical behavior and malignant potentiality. Histogenesis of ovarian tumor includes a complex wide spectrum of neoplasm depending upon the origin of cell i.e. tumor arising from epithelial tissue, germ cell and connective tissue.[6]

Identification of high risk population for ovarian malignancy and ideal screening methods are not available. Determination of various histologic patterns of ovarian tumors is very important in diagnosis as well as prognosis of these tumors.[7,8]

Early diagnosis is difficult due to its asymptomatic nature, inaccessible site and the limited use of various new techniques like frozen section, cytology and biopsy.[9] Ovarian tumors are notorious for their large size and frequent association with minimal symptoms.[10]

Variable histopathological presentations of ovarian tumours lead to detection in advanced stage where neither effective surgery nor chemotherapy can be done.[8]

Diagnosis of ovarian tumor depends on signs and symptoms, abdominal and vaginal ultrasound, doppler study of tumor vasculature, biochemical study (tumor markers) which are proteins associated with malignant tumors like CA125, Beta-HCG, alpha-fetoprotien. However, the definitive diagnosis and staging is done by surgery and histopathology.

Most commonly used ovarian tumor marker is CA-125. It is a antigen dependent, high molecular weight glycoprotein. It is screening test and not diagnostic test. As they are elevated in other benign conditions like endometriosis, pelvic inflammatory disease, tuberculosis, appendicitis.

Ovarian tumors are also a constant source of confusion to the pathologists because of the wide spectrum of clinical and morphological features. Further, certain non-neoplastic lesions of ovary frequently form a pelvic mass and often associated with abnormal hormonal manifestations, thus potentially mimicking ovarian neoplasm.[3]

Tumors in women under 40years age have greater chances of recovery than older age group.[8] Prognosis can be predicted from the degree of differentiation of the tumors & the laterality of the tumor also indicates their nature.[11]

Ovarian tumors at an advanced stage are easy to diagnose but associated with poor prognosis despite advances in surgery, chemotherapy, and more recently, targeted therapy.[3]

The overall 5-year survival rate is less than 50% because lack of specific screening test and its asymptomatic nature so early diagnosis is difficult.[12]

2. Materials and Methods

2.1. Study design

Retrospective hospital-based study conducted in the Department of Obstetrics & Gynecology, GSL Medical College and General Hospital from December 2019 to December 2020.

2.2. Inclusion criteria

All ovarian tumors clinically, radiologically, histopathologically proved benign tumors were included in this study.

Cases of suspected benign ovarian cysts like para-ovarian cyst, fimbrial cysts identified surgically have been excluded.

2.3. Exclusion criteria

Clinically, radiologically, or pathologically proved malignant ovarian tumors, metastatic tumors were excluded in this study and was referred to oncology unit.

2.4. Data collection and analysis

Relevant clinical information regarding the age, clinical features, radiological findings, surgical and histopathological findings and provisional diagnosis are obtained.

Patients with symptomatic and large ovarian tumors underwent ovarian cystectomy or oophorectomy or staging laparotomy and specimen was sent to histopathological examination.

Patients suspected to be malignant on radiological and clinico-pathological findings are sent to oncology unit.

3. Result

A total of 82 cases of ovarian tumors were studied. The clinical presentation, symptoms and their histopathological examination were studied and recorded.

Table 1: Distribution of ovarian tumors according to age group

Age group	Benign	Borderline	Malignant
15-25yrs	2	-	-
26-35yrs	9	1	1
36-45yrs	23	-	1
46-55yrs	18	1	3
>56yrs	11	2	10
Total	63(51.6%)	4(3.28%)	15(12.3%)

Among all the lesions, majority of the cases of malignant, benign and borderline lesions were seen in age group of 40-59 years. The youngest patient was 19 years old and the oldest was 71 years. Benign tumors most commonly seen in younger age groups, malignant tumors seen in older age group.

Table 2: Distribution of ovarian tumors according to their marital status and parity

Marital/parity	Benign	Borderline	Malignant
Unmarried	5	0	1
Nullipara	11	1	5
Para1	17	0	1
Para 2	10	2	2
Para 3	6	0	2
Para 4	8	0	2
Para 5 & above	6	1	2
Total	63	4	15

Incidence of malignancy is inversely proportional to parity. In the present study, it was observed that malignant tumour were common in nulliparous women.

Table 3: Distribution of ovarian tumors according to laterality

Ovarian tumors	Unilateral	Bilateral
Benign	57	6
Borderline	3	1
Malignant	13	2
Total	73	9

Present study comprised of 63 cases of benign lesions of ovary, In which 57(90.4%) cases had unilateral, 6 cases(9.52%) had bilateral ovarian tumors. Most of malignant tumors were unilateral.

Present study comprised of 55 cases of neoplastic lesions of ovary.

In which 12 patients had bilateral ovarian tumours, while majority were unilateral.

Table 4: Symptoms frequently associated with ovarian tumors

Clinical symptoms	No. of cases	Percentage
Abdominal pain	22	18.04%
Menstrual irregularities	20	16.4%
Abdominal mass only	10	8.2%
Abdominal Pain with abdominal mass	15	12.3%
Abdominal pain with white discharge per vaginum	8	6.56%
Abdominal pain with menstrual irregularities	7	5.4%
Total	82	100%

Majority of cases present with abdominal pain (18%), followed by menstrual irregularities (16.4%). Incidentally found tumors range from 1-2%. Ascites is the least common.

Table 5: Consistency of ovarian tumors

Lesion	Solid	Cystic	Solid+cystic
Benign	6	50	7
Borderline	0	2	2
Malignant	4	0	11
Total	10	52	20

Majority of the benign lesions were cystic in consistency, while few cases had both solid and cystic consistency whereas majority of borderline and malignant lesions were solid and both solid and cystic in consistency.

Majority of benign ovarian tumors in our study i.e, 48 were uniloculated, 15 multiloculated, out of 4 borderline tumors, 3 were multiloculated, 1 was uniloculated, of 15 malignant tumors, 12 were multiloculated, 3 uniloculated. Solid components in benign tumors were 4-6mm in diameter in 43cases, <3 in 7cases, 6-10mm in13cases. Out of 4 borderline tumors,2 were 7-10mm, other 2 cases <5mm. out of 15 malignant tumors, 14 cases showed solid components of >10mm diameter, 1case showed 5-6mm diameter. Of 63 cases of benign tumors, Papillary projections 58cases had <3, 5 cases had 2-4. In borderline tumors all tumors had 2-4 papillary projections, 13 cases had >5 papillary projections, 2 cases had >5 papillary projections in malignant tumors. Septations in benign were thin in 60 cases, 3 cases had no Septations, in borderline tumors 3 had thin septations, 1 had thick septations, all malignant tumors had thick septations. Colour doppler in benign tumors is variable with nil to minimum vascularity, in borderline tumors moderate, malignant tumors high vascularity noted. No to minimal ascites in benign tumors, minimal in borderline, moderate to severe ascites in malignant tumors. ORADS score was 3 in 3 benign tumors, 58 cases showed score of 4, 2cases showed score of 5. Out of 4 borderline tumors, 1 case showed ORADS of 4, 3cases showed ORADS of 5. Out of 15 malignant ovarian tumors, 15tumors showed ORADS of 5.

In all ovarian tumors, Ca-125 advised routinely. Normal value of CA-125 is < 35 in postmenopausal, 200 U/ml in reproductive age group. Of 83 cases, 59 cases had normal value, 23 cases had elevated value. Only in suspected cases of sex cord/ germ cell tumors their specific tumor markers have been sent.

Surface Epithelial ovarian tumors most common followed by germ cell tumors, later sex cord stromal tumors.

4. Discussion

Ovarian neoplasms have a varied histiogenesis, clinical behaviour and malignant potential. Due to the inability to detect ovarian tumours in the early stage, they account for a disproportionate number of fatal cancers, being responsible for almost half of deaths from cancer of female genital

Table 6: Ultrasonographic findings of ovarian tumors

Tumors	Benign	Borderline	Malignant
Loculations	48-unilocular 15-multilocular	3-multilocular 1-unilocular	12-multilocular 3-unilocular
Solid components (diameter)	43 (4-6) 7 (<3) 13 (6-10)	2 (7-10) 2 (<5)	14 (>10) 1 (5-6)
Papillary projections	58 (<3) 5 (no)	4 (2-4)	13 (>5) 2 (3-5)
Septations	60 (Thin septations) 3 (No septation)	3 (Thin septations) 1 (Thick septations)	15 (Thick septations)
Colour doppler	48 (No) 13 (minimal)	4 (Moderate)	15 (High)
Ascitis	61 (no) 2 (minimal)	3 (minimal) 1 (no)	15 (Moderate-severe)
ORADS	3(score: 3) 58(score: 4) 2(score: 5)	1 (score: 4) 3 (score: 5)	15 (score: 5)

Table 7: Tumor markers

Tumor markers	Normal	Elevated
Ca-125	59(<35U/ml)	23(>200U/ml)
S. LDH	1(<450iu/l)	2(600iu/l-800iu/l)
Alpha fetoprotein	3(<15ng/ml)	1(200ng/ml)
CEA	10(<5ng/ml)	5(125-300ng/ml)
Beta HCG	(3mIU/ml)	2(300-500mIU/ml)

Table 8: Histopathology of tumors

Tumor	No of neoplasms	Percentage
Surface epithelial tumors	65	78.3%
Serous tumors	51	61.4%
Serous cyst adenoma	41	49.3%
Borderline serous cystadenocarcinoma	3	3.6%
Serous cystadenocarcinoma	7	8.43%
Mucinous tumors	14	16.86%
Mucinous cystadenoma	11	13.25%
Mucinous cystadenocarcinoma	2	2.4%
Borderline mucinous cystadenoma	1	1.2%
Germ cell tumors	14	16.86%
Benign cystic teratomas	11	13.25%
Malignant teratoma	1	1.2%
Dysgerminoma	2	2.40%
Sex cord stromal tumors	3	3.61%
Fibroma	1	1.2%
Granulosa cell tumors	2	2.4%

tract.[11]

The incidence, clinical appearance and the behavior of the different types of ovarian tumors is extremely variable. It is generally impossible to diagnose the nature of the ovarian tumor just by clinical or gross examination, although it provides important diagnostic clues in formulating a differential diagnosis.[3]

A total of 82cases of ovarian tumors in a 1-year period were studied. In this study, Out of 82 cases, 63(51.6%) cases were benign, 15 (12.3%) cases were malignant and 4 (3.28%)were borderline tumors. Similar results were obtained in different study groups in which majority of them are benign.

In our study, majority of benign cases were seen around 36-45years age group, where as malignant cases seen in postmenopausal woman (>56years age group), similar to the study conducted by Agarwal et al,[3] Amita et al.[12]

Majority of the tumors in the present study were cystic (31.5%) in consistency. Majority of benign tumors are cystic in consistency (79.3%), solid & cystic(11.1%), solid(9.5%). Majority of malignant tumors were both solid and cystic consistency (68.75%).

In our study, majority of them presented with abdominal pain(18.04%), followed by menstrual irregularities (16.4%), abdominal mass associated with pain abdomen(12.3%), only with abdominal mass (8.2%), abdominal pain with menstrual irregularities(5.4%). In study conducted by Amita et al.[12] abdominal pain is common symptom(48.8%), followed by abdominal mass(20.9%), menstrual irregularities.

In our study, most of ovarian tumors were unilateral(90.2%). Benign ovarian tumors were unilateral(90.4%), bilateral(9.52%). Most of the malignant tumors were also unilateral(87.5%). Similar to the study conducted by Amita et al,[12] Thakkar et al,[13] Couto F et al.[14]

Majority of benign ovarian tumors in our study were uniloculated, borderline tumors were uni-multiloculated, malignant tumors were multiloculated. Solid components in benign tumors were 4-6mm in diameter, in borderline tumors 7-10mm, malignant tumors >10mm. Papillary projections in benign were <3, 2-4 in borderline tumors, >5 in malignant tumors. Septations in benign were thin, borderline tumors variable, malignant tumors had thick septations. Color doppler in benign tumors is variable with nil to minimum vascularity, in borderline tumors moderate, malignant tumors high vascularity noted. No Ascites in benign tumors, minimal in borderline, moderate to severe ascites in malignant tumors.

In our study, majority of them are surface epithelial tumors 77.1%, followed by germ cell tumors (16.86%). Serous cyst adenoma(49.3%) was most common benign tumor, serous cyst adenocarcinoma was most common malignant tumor(8.43%). Similar to the study conducted by Sharma et al.[15]

Ovarian cancer associated tumor marker is CA-125. CA-125 is an antigen determinant on high molecular weight glycoprotein. Serum CA-125 assay is useful pre-operative test for prediction of epithelial ovarian cancer and provides additional data to help discriminate between benign and malignant ovarian tumors as well as select an adjunct screening modality. CA-125 was done in all suspected ovarian tumors. In benign tumors, majority of benign tumors ca-125 is within normal limits, out of 63 cases, only 5 cases showed elevated ca-125. In malignant tumors, in majority of them ca-125 was elevated. Alpha fetoprotein was elevated in 5 cases of germ cell tumors. Lactate dehydrogenase elevated in dysgerminoma. Similar findings noted in the study conducted by Agarwal et al.[3]

Even though clinico-radiological findings suggestive of benign tumors, 4 cases were suspicious of malignancy at the time of surgery & since frozen section was not available in our institute, consent was taken from attenders for staging laparotomy and dissection of lymph nodes done. In case of suspected mucinous ovarian tumors, appendectomy was done.

Then the patients were sent to oncology for further management. Among them 2 are mucinous cystadenocarcinoma, 1 is serous cyst adenocarcinoma, 1 is borderline mucinous cystadenocarcinoma.

5. Conclusion

Ovarian tumor is still one of the leading cause of morbidity and mortality. The incidence of ovarian tumor is increasing gradually and there is a need of awareness of disease in women.

Benign ovarian tumors are far more common than their malignant counterparts with surface epithelial tumors being the commonest followed by germ cell tumors.

6. Source of Funding

None.

7. Conflict of Interest

The authors declare no conflict of interest.

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