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Clinical and Histopathological Correlation of Ovarian Tumour

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I. INTRODUCTION

Ovarian masses are common forms of neoplasms in women. Ovarian tumours that present in the reproductive age group are mostly benign while about 30% in the postmenopausal age group are malignant [1]. They present themselves in various clinical forms and surprisingly many a time as vague, non-gynaecological complaint. Ovarian tumours also present in a wide spectrum of histopathological patterns. Many ovarian tumours are asymptomatic in the early stages and are unfortunately diagnosed in the advanced state. The high mortality rate of ovarian cancer is due to its late detection. Epithelial ovarian cancer is the ninth most common cancer among women [3]. Ovarian cancer rates increase exponentially with age. About 70% of tumours occur in the reproductive age. Low parity, genetic and environmental factors are associated with an increase risk factor of ovarian cancer. Patients with ovarian neoplasia are either asymptomatic or with nonspecific symptoms like abdominal pain, abdominal distention and urinary symptoms.

The total number of Ovarian cancer cases worldwide has been estimated to be 1, 92,000 per year in 2000 [2]. Ovarian malignancy ranks fifth in cancer deaths among worldwide and third among the female genital tract malignancy in India with age-adjusted standardized ratio of 6.7/100,000 [1]. In India, during the period 2004–2005, proportion of ovarian cancer varied from 1.7 to 8.7 % of all female cancers in various urban and rural population-based registries [3]. The 5-year relative survival rate is around 25.4 % for ovarian malignancy [4]. Higher survival is noted in patients younger than 35 years and with localized early-stage disease.

The initial treatment includes abdominal exploration, staging and resection of all grossly identifiable disease. Ovarian tumours cannot be distinguished from one another on the basis of their clinical, radiological or gross characteristic alone. Research is focused to answer the following parameters to characterise the disease such as

- Age at diagnosis
- Clinical characteristics of its presentation
- Size of the tumour to know the malignant potentiality
- Percentage of bilaterality and unilaterality
- Provisional diagnosis at Presentation.
- The stage of the tumour
- The Operative findings
- Its Histo-pathological types
- The Chemotherapy regimen for it
- Its Chemotherapy response
- The period of disease free survival
- The percentage of its recurrence

Most ovarian tumours cannot be confidently distinguished from one another on the basis of their clinical or gross characteristics alone. These features provide important diagnostic clue in some cases; however, in such cases, both clinician and the pathologist should share their possibly valuable information in establishing correct diagnosis [4].

The complex nature and unpredictable behaviour and prognosis, controversial management make the ovarian tumours a difficult problem for gynaecologist. The histogenesis of many tumours are interrelated and accurate histopathological diagnosis is needed for effective treatment.

II. MATERIALS AND METHOD

This study was done retrospectively in the department of Pathology in Hitech medical college and Hospital, Bhubaneswar in the period of 2016 and 2017. 230 Histologically proven cases of ovarian tumours operated in our institute were analysed. Leading symptoms such as abdominal mass, abdominal swelling/ discomfort, abdominal pain, gastrointestinal symptoms, urinary symptoms, generalized malaise and fatigue were scrutinized. The data were collected on a pro forma, which consists of the relevant information about age, parity, family history, clinical presentation, size of tumour, bilaterality, provisional diagnosis, operative findings, and histopathological analysis.

Specimens without the complete information were excluded from the study. The slides were stained with haematoxylin and eosin (H and E) stain and reviewed.

III. RESULTS

In the present study, 230 cases of ovarian neoplasms were studied during 2 years from 2016 to 2017. Frequency of Benign and Malignant Tumours of Ovary Out of 230 neoplastic lesions, 198 cases were benign comprising 86% and 32 cases were malignant accounting for 14% (Table 1).

TABLE-1:

Type of neoplasm	No of case	%
Benign	198	86%
Malignant	32	14%
Total	230	100%

The Clinical Presentation of the Patients with Ovarian Tumor: The most common symptom was mass per abdomen (102 cases; 44%) followed by pain abdomen (71 cases; 31%), menstrual abnormalities (40 cases; 17.4%), gastrointestinal disturbances (6 cases; 2.6%), infertility (4 cases; 1.7%), ascites (3 cases;1.3%) and weight loss and anorexia (4cases;1.7%) (Table 2).

TABLE-2:

Clinical presentation	No of cases	%
Abdominal mass	102	44%
Pain abdomen	71	31%
Menstrual irregularities	40	17.4%
GI disturbances	6	2.6%
Wt loss /anorexia	4	1.7%
Infertility	4	1.7%
Ascites	3	1.3%

Distribution of Tumours in the Different Age Groups: The youngest case was 7-year-old child with abdominal mass having benign cystic teratoma involving both ovaries and the oldest case was an81-year-old female with metastatic carcinoma ovary presented with ascites. Majority of the cases (78 cases; 34%) were in the age group of 31-40 years, followed by 21-30 years age group (62 cases; 27%) and 41-50 years age group (45 cases; 19.5%) (Table 3).

TABLE-3:

Age range(yrs.)	No of cases	%
0-10	3	1.3%
11-20	17	7.4%
21-30	62	27%
31-40	78	34%
41-50	45	19.5%
51-60	9	4%
61-70	12	5.2%
>70	4	1.7%

Laterality of Ovarian Tumours: In the present study, majority of the benign tumours (189 cases) were unilateral accounting for 95.5% and only 9 cases (4.5%) had bilateral tumours. Among the malignant tumors,27 cases had unilateral tumours accounting for 84.3% and 5 cases (15.7%) had bilateral tumours (Table 4).

TABLE-4:

Laterality	Benign (%)	Malignant (%)	Total
U/L	189(95.5%)	27(4.5%)	198(100%)
B/L	9(84.3%)	5(15.7%)	32(100%)

Size Ranges of Ovarian Neoplasms: In the present study, most of the tumours (113 cases) were in 5-9 cm size range accounting for 49.1%, followed by 10-19 cm size range (54 cases; 23.5%). Most of the tumours in 5-9 cm size range were benign in nature. Most of the large tumours (>20 cm) were malignant accounting for 7% (16 cases) (Table 5).

TABLE-5:

Size (cm)	No of cases	%
<4	47	20.4
5-9	113	49.1

10-19	54	23.5
>20	16	7

Cut Section of Ovarian Neoplasms: In the present study, majority of ovarian neoplasms (172 cases; 74.8%) showed cystic areas on cut section, of which most of them were benign (158 cases; 79.8%). Among the malignant tumours, most of the tumours (18 cases, 56.2%) showed solid and mixed solidand cystic areas (Table 6).

TABLE-6:

Type of neoplasm	cystic	Solid	Cystic-solid	Total
Benign	158(79.8%)	2	38	198
Malignant	14(43.7%)	6(18.7%)	12(37.5%)	32
Total	172(74.8%)	8(3.5%)	50(21.7%)	230

Histological Types of Ovarian Neoplasms: Surface epithelial tumours accounted for 64.5% (148 cases) and formed the major group of ovarian tumours, followed by germ cell tumours, mostly benign cystic teratoma (62 cases; 27%) and sex cord-stromal tumours(12 cases; 5.2%). 6 case showed secondary deposits (2.6%) and 2cases was an undifferentiated tumour (0.8%). (Table 7).

TABLE-7:

Tumor type	No of cases	%
Surface epithelial tumor	148	64.5%
Germ cell tumor	62	27%
Sex-cord-stromal tumor	12	5.2%
Metastasis	6	2.6%
Undifferentiated tumor	2	0.8%

Among the surface epithelial-stromal tumors, serous cystadenomas were the most common (96 cases; 41.7%). Among the germ cell tumors, benign cystic teratomas were the most common (61 cases; 26.5%). Immature teratoma was the only malignant case presented at the age of 9 years, involving both the ovaries. The mucinous cystadenomas were presented in 38 cases (16.5%). Among the 12-sex cord-stromal tumors, granulosa cell tumors were the most common (3 cases 1.3%). Two cases were adult granulosa cell tumors with all the classical features, and another case was a juvenile granulosa cell tumor of well-differentiated type. Two caseswere Leydig cell tumours (1.3%), presented at the age of 41 years as a unilateral solid tumor with primary infertility. Another case was a gynandroblastoma, presented at the age of 69years, and 6 cases (2.6%) were benign sex cord-stromal tumor with bilateral fibromas. (Table 8).

TABLE-8:

Histological type of tumor	No of cases	%
Serous cystadenoma	67	29.1
Serous cystadenofibroma	3	1.3
Papillary serous cystadenoma	20	8.7
Papillary serous Borderline	6	1.3
Papillary serous cystadenocarcinoma	7	3
Mucinous cystadenoma	38	16.5
Mucinous carcinoma	5	2.1
Mixed serous-mucinous carcinoma	2	0.8
Benign fibroma	6	2.6
Granulosa cell tumor	3	1.3
Gynandroblastoma	1	0.5
Leydig cell tumour	2	0.8
Benign cystic teratoma	61	26.5
Immature malignant teratoma	1	0.5
Secondary deposits	6	2.6
Unclassified tumor	2	0.8

IV. DISCUSSION

Ovarian tumours manifest a wide spectrum of clinical, morphological and histological features. The clinicopathological profile of the ovarian tumours diagnosed and operated at our institution during the past two years were analysed. The clinical parameters like age at diagnosis, presenting symptoms, ascites, size, consistency, and bilaterality of ovarian tumours were compared in relation to the histological type of the tumour.

In the present study, 230 ovarian neoplasms were recorded during the study (2016-2017). The retrospective study with regards to ovarian neoplasms was done in a detailed manner. Clinical and pathological

findings of these tumours were analysed and correlated with different studies. According to the studies, the frequency of benign lesions was more when compared to malignant lesions of the ovary. Our observations were very much similar.

In the present study, 198 cases (84%) were benign and 32 cases (14%) were malignant. This is similar to the studies conducted by Gupta et al., [6] Jha and Karki, [7] Kuladeepa et al., [8]and Shoailet al., [9] showing that the frequency of benign ovarian tumours was more compared to that of borderline and malignant (Table 9).

TABLE- 9: Frequency of benign and malignant tumours of ovary

Study	Benign (%)	Borderline (%)	Malignant (%)
Gupta et al.	72.9	4.1	22.9
Jha and Karki	83.9	-	16.1
Kuladeepa et al.	82.35	3.68	13.97
Shoail et al.	74.8	1.6	23.4
Present study	83.4	2.6	14

Comparison of Clinical Presentations in Ovarian Neoplasms: In the present study, most of the patients with ovarian neoplasms presented with mass per abdomen (44%), followed by pain abdomen in 31% of cases. 17.4% of cases were presented as menstrual irregularities. This observation was very much similar to the studies conducted by Kuladeepa et al.8 In the study done by Yasmin et al., [10] and Lina Baru et al. pain abdomen was the most common symptom (Table 10).

TABLE-10:

Symptoms	Yasmin et al	Kuldeep et al.	Lina baru et al	Present study
Abdominal mass	14.71%	67.16%	31.8%	44%
Pain abdomen	70.59%	63.4%	79.55%	31%
Menstrual problems	4.41%	14.4%	9.1%	17.4%
GI symptoms	7.35%	11.94%	15.9%	2.6%
Wt loss /anorexia	-	4.47%	-	1.7%
Infertility	-	0.04%	-	1.7%
Ascites	-	4.7%	18.1%	1.3%

Distribution of Ovarian Tumours in Different Age Groups: Our present study was similar to the studies conducted by Jagadeeshwari et al. (1990) [13] and Verma and Bhatia, [14] in which the frequency of ovarian tumours was more in the age group 31-40 years and ameena Ashraf et al. (2012) [15] showed 21-30 years (Table 11).

TABLE-11:

Age group(years)	Jagadeeshwari et al. (1971) n=265 (%)	Verma and Bhatia n=403(%)	Ashraf et al. n=212 (%)	Present study n=230(%)
0-10	-	4(3.01%)	1(0.47%)	3(1.3%)
11-20	10(10.53%)	13(9.77%)	27(12.79%)	17(7.4%)
21-30	25(26.32%)	23(17.29%)	64(30.19%)	62(27%)
31-40	28(29.97)	63(27.07%)	48(22.64)	78(34%)
41-50	20(21.05%)	29(21.8%)	39(18.4%)	45(19.5%)
51-60	9(9.47%)	22(16.54%)	22(10.38%)	9(4%)
61-70	3(3.16%)	4(3.01%)	8(3.77%)	12(5.2%)
>70	-	2(1.5%)	3(1.41%)	4(1.7%)

Laterality of Benign Ovarian Tumours: The observation was very much similar to the studies conducted by Pilli et al., [16] Jha and Karki, [17] and Kuladeepaet al. [18] showing most of the benign tumours were unilateral, of which most of them were surface epithelial tumours and germ cell tumours (Table 12).

TABLE-12:

Study	U/L	B/L
Pilli et al.	92.2%	7.8%
Jha and Karki	93.3%	6.7%
Kuladeepa et al	93.75%	6.25%
Present study	95.5%	4.5%

Laterality of Malignant Ovarian Tumours: Our observations were very much similar to the studies conducted by Prabhakar andMaingi, [17]Misraet al., [18] Couto et al., [18] and Kuladeepaet al. [19] showing that most of the malignant tumours are unilateral (Table 13).

TABLE-13:

Study	U/L	B/L
Prabhakar and Maingi	78.1%	21.9%
Misra et al.	82.98%	17.02%
Couto et al.	72.4%	27.6%
Kuladeepa et al.	68.42%	31.58%
Present study	84.37%	15.63%

Comparison of Size Ranges: Our study was similar to the study conducted by Okugawa et al., [20] which had the mean size of 4-9 cm (Table 14).

TABLE-14:

Size(cm)	Okugawa et al. n=1648 (%)	Present study
<4	100(6.07%)	47(20.4%)
5-9	658(39.93%)	113(49.1%)
10-19	589(35.74%)	54(23.5%)
>20	152(9.22%)	16(7%)

Frequency of Histological Types of Ovarian Neoplasms: Our study was similar to Ramachandran et al., [21] Verma and Bhatia, [14] Swamy and Satyanarayana, [22] and Mondal et al. and Ashraf et al., [15] in which surface epithelial tumours were the most common, followed by germ cell tumours (Table 15).

TABLE-15:

Type of tumor	Swamy and Satyanarayana (n=120)	Ashraf et al. (n=127))	Jha and Karki (n=161)	Santhosh et al. (n=957)	Present study N=230
Surface epithelial	61.6%	52.76%	52.2%	67.9%	64.5%
Sex cord-stromal	21.7%	43.31%	42.2%	5.6%	5.2%
Germ cell tumor	11.7%	3.15%	3.1%	23.1%	27%
metastasis	5%	0.78%	2.4%	3.2%	2.6%
undifferentiated	-	-	-	-	0.8%

V. CONCLUSION

The ovarian tumors are one of the most common tumor in the women of reproductive age group. They manifest a complex wide spectrum of clinical and pathological features. Proper correlation of age, clinical features, gross appearance, various histological patterns, and categorizing according to the WHO classification help in early and accurate diagnosis as well as prognosis of ovarian tumors. Although histopathological study is still the gold standard in diagnosing most of the primary ovarian tumors, may be supplemented by the newer techniques such as immunohistochemistry, morphometric analysis, and flow cytometric analysis of ploidy status, to resolve the difficult, dilemmatic cases and also to predict the prognosis.

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