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Original Research Article

Clinico pathological study of ovarian neoplasms

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ABSTRACT

Background: Ovarian tumors are common form of neoplasm in women and account for 30% of female genital tract cancers. Ovarian cancer is the sixth most common cancer in women and the leading cause of death in women with gynaecological malignancy. Due to inefficient diagnosis/prognosis strategies mainly due to the lack of specific symptoms at the initial stage of the disease about 70% cases diagnose at advanced stage when the metastatic tumor has acquired drug resistant phenotype.
Methods: Prospective study of two years duration with sample of 108 cases of simple oophorectomy and hysterectomy with unilateral or bilateral salpingo oophorectomy specimens are included in this study.
Results: Maximum cases were in the age group of 21 to 45 years. Mean age of presentation was 42.84 years (benign tumors), 46.66years (Borderline tumors) and 32.6 years (malignant tumors). Epithelial ovarian tumors are the commonest and constituted 78.7% of all ovarian tumors. In present study 40.74% were benign, 2.78% were borderline and 56.48% were malignant ovarian tumors.
Conclusions: Most of the ovarian neoplasms presented in the reproductive age group but ovarian malignancy can occur at all age group and abdominal symptoms are the only clue for the diagnosis of the disease. There is no definite universal screening protocol yet, for malignant ovarian tumors however abdominal symptoms supported by tumor markers like serum CA-125 and ultrasound of abdomen and pelvis with Doppler may be yardstick for early diagnosis of malignant ovarian tumor.

Keywords: Benign, Ovarian neoplasm, Oophorectomy

INTRODUCTION

Ovary is an important organ concerned with the reproduction of progeny. Ovarian tumors are common form of neoplasm in women, account for 30% of female genital tract cancers.[1] Ovarian cancer is the sixth most common cancer in women and the leading cause of death in women with gynecological malignancy.[2] Epithelial ovarian cancer is the ninth most common cancer among women[3]. Ovarian cancer rates increase exponentially with age. About 70% of tumors occur in the reproductive age. Low parity, genetic and environmental factors are associated with an increase risk factor of ovarian cancer. Patients with ovarin neoplasia are either asymptomatic or with nonspecific symptoms like abdominal pain, abdominal distention and urinary symptoms.

Gynecologists receive the major load due to ovarian lesion not only because of the anatomical location but also these tumors remain unnoticed for long period of time. Due to inefficient diagnosis, prognosis strategies mainly due to the lack of specific symptoms at the initial stage of the disease about 70% cases diagnose at advanced stage. Serum CA-125 have been proven

nonspecific, so that their diagnostic relevance remains controversial.

The initial treatment includes abdominal exploration, staging and resection of all grossly identifiable disease. Ovarian tumors 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 tumor to know the malignant potentiality
- Percentage of bilaterality and unilaterality
- Provisional diagnosis at Presentation.
- The stage of the tumor
- 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

Objective of present work were to study various clinical presentations and age distribution pattern of ovarian neoplasms, to study histo-morphological features of ovarian neoplasms which are more prevalent in our population and to study the frequency of benign and malignant neoplasms of ovary in this region.

METHODS

108 Histologically proven cases of ovarian tumor operated in our institute were analyzed. Information abstracted were age, parity, family history of cancer, personal history of previous malignancies, symptoms and the duration of symptoms. Leading symptoms such as abdominal mass, abdominal swelling/ discomfort, abdominal pain, gastrointestinal symptoms, urinary symptoms, generalized malaise and fatigue were scrutinized.

All patients under went routine physical examination. Particular attention was paid to breast examination, lymphadenopathy, abdominal examination and pelvic examination. Preoperative evaluation included routine investigations, estimation of serum CA 125, assessment of cardiovascular system, imaging studies and radiography of chest.

Laparotomy was done in all cases. The type of surgical procedure done are either unilateral salpingo-oophorectomy, unilateral salpingo-ophorectomy with wedge resection of the cotralateral ovary, total transabdominal hysterectomy and unilateral salpingo oophorectomy, total trans abdominal hysterectomy with bilateral salpingo oophorectomy, with ometectomy and debulking surgery. Surgical staging was carried out in suspected malignant ovarian tumors. Surgical staging involved systemic exploration of the under surface of the diaphragm, liver stomach, bowel and omentum. Biopsies were taken from suspicious areas and adhesions. Ascitic fluid and peritoneal wash was collected in heparinized bottles for cytology. The pelvic and para-aortic lymph nodes were evaluated and all enlarged lymph node resected. Intracolic omentectomy was performed. The ovaries and uterus was studied. The surgical staging was followed by definitive surgery or debulking.

The other operative findings that were recorded are gross appearance and cut surface, ascites, site of extra ovarian involvement and tumor size. The specimen was sent for histopathological study. FIGO staging of the ovarian cancer was performed from the operational and histological findings. Classification of all histological diagnosis was based on world health organization histological classification of ovarian tumors. Clinical data, operative findings histopathological findings, surgical stage and complications were recorded.

RESULTS

Out of 108 cases studied, most common encountered were papillary serous cystadenocarcinoma 31/108 (28.7%) followed by mucinous cystadenocarcinoma 12/108 (11.1%), mucinous cystadenoma 11/108 (10.2%) and dermoid cyst 11/108 (10.2%).

Table 1: Incidence of various ovarian tumors.

Type of tumor	Incidence	%
Serous custadenoma	5	4.6
Serous cystadeno fibroma	1	0.9
Serous borderline epithelial tumor	1	0.9
Papillary serous cystadenoma	7	6.5
Serous cystadenocarcinoma	7	6.5
Papillary serous cystadenocarcinoma	31	28.7
Mucinous cystadenoma	11	10.2
Papillary mucinous cystadenoma	3	2.8
Borderline mucinous tumor	2	1.8
Mucinous cystadenocarcinoma	12	11.1
Papillary mucinous cystadenocarcinoma	5	4.6
Granulosa cell tumor	2	1.8
Sertoli-leydig cell tumor	1	0.9
Dysgerminoma	1	0.9
Yolk sac tumor	1	0.9
Dermoid cyst	11	10.2
Mature cystic terratoma	4	3.7
Krukenberg tumor	3	2.8
Total	108	

Majority of them are malignant tumors 61/108 (56.48%) followed by benign tumors 44/108 (40.74%) and borderline tumors 3/108 (2.78%).

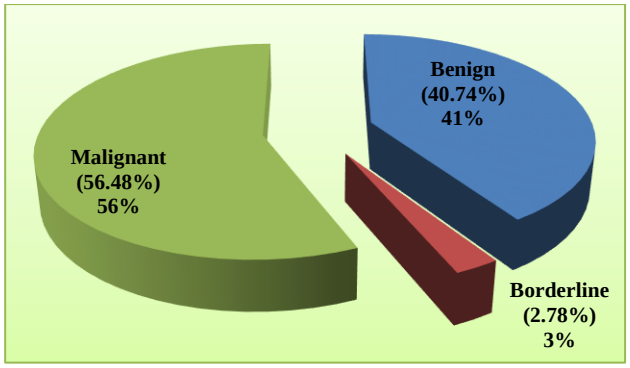

Figure 1: Type of ovarian tumours.

Surface epithelial tumors are the commonest constituting 85/108 (78.7%) followed by the germ cell tumors 17/108 (15.7%) and the sex-cord stromal tumors 3/108 (2.8%).

Table 2: Cell of origin and histological type of the tumor.

Tumor type	Nos.	%
Surface epithelial tumors		
Serous cystadenoma	5	
Papillary serous cystadenoma	7	
Serous cystadeno fibroma	1	
Serous borderline epithelial tumor	1	
Serous cystadenocarcinoma	7	
Papillary serous cystadenocarcinoma	31	
Mucinous cystadenoma	11	
Papillary mucinous cystadenoma	3	
Borderline mucinous tumor	2	
Mucinous cystadencarcinoma	12	
Papillary mucinous cystadeno carcinoma	5	
Total	85	78.7
Sex-cord stromal tumors		
Granulosa cell tumor	2	
Sertoli-leydig cell tumor	1	
Total	3	2.8
Germ cell tumors		
Dysgerminoma	1	
Dermoid cyst	11	
Mature cystic terratoma	4	
Yolk sac tumor	1	
Total	17	15.7
Metastatic tumors		
Krukenberg tumor	**3**	**2.8**

Out of 108 cases ovarian tumors 53/108 (49.07%) were between the age of 21 to 45 years, 48/108 (44.43%) were above 46 years and 7 cases (6.5%) were less than 20 years. Amongst benign tumors maximum number 26/44 (59.9%) of cases were seen between 21-45 years. Similarly, maximum number of malignant cases 26/61 (42.6%) were seen between 21 -45 years. Out of 108 cases 0.9% were seen in premenarcheal children, 57.4% were seen in reproductive age group women and 41.7% were seen among post-menopausal women. Maximum number of ovarian tumor cases seen in reproductive age group women.

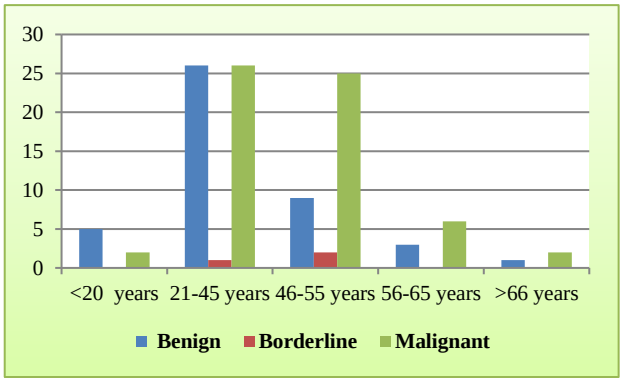

Figure 2: Ovarian tumours in different age group.

Out of 108 cases of ovarian tumors 24 (22.22%) were nulliparous and 84 (77.78%) were multiparous. Of the 44 benign tumors 12 (27.27%) were nulliparous and 32 (72.73%) were multiparous. Out of 61 malignant ovarian tumors 11 (18.03%) were nulliparous and 50 (81.97%) were multiparous.

Table 3: No. of cases in relation to histological type of ovarian tumor and parity.

Histological type	Nulliparous	Multiparous	Total
Benign	12 (27.27%)	32 (72.73%)	44
Borderline	1 (0.9%)	2 (1.85%)	3
Malignant	11 (18.03%)	50 (81.97%)	61
Total	24 (22.22%)	84 77.78%)	108

Table 4: Incidence of ovarian tumors in relation to parity.

Marital status and parity	Type of tumor		Total
	Benign	Malignant	
Unmarried	6 (13.64%)	8 (13.11%)	14
Nulliparous	12 (27.27%)	11 (18.03%)	23
Parity -1	3 (6.8%)	5 (8.19%)	8
Parity -2	9 (20.45%)	8 (13.11%)	17
Parity-3	12 (27.27%)	12 (19.7%)	24
Parity-4	8 (18.18%)	20 (32.8%)	28
Parity 5 and above	0	5 (8.19%)	8
total	44	61	108

Among benign tumors 6.8%, 20.45%, 27.45% and 18.18% cases of ovarian tumor were seen among para-1, para-2, para-3 and para-4 respectively. There were no cases observed among women of para more than 5. Of the 61 malignant ovarian tumors 8.19%, 13.11%, 19.7% and 32.8% of cases of ovarian tumor were seen among women with parity 1,2,3 and 4 respectively. Of the malignant ovarian tumors 5 (8.19%) were seen among

women with parity 5 and above. Unmarried women among benign tumors were 13.64% and unmarried women among malignant tumors were 13.11%.

Most of the ovarian tumors 58/108 (53.7%) are within 10 to 19 cm. Maximum number of surface epithelial tumors 46/85 (51.11%) were within 10-19cm.The malignant tumors are larger in comparison to benign tumors.

Table 5: Number of cases in relation to size and histological type of the ovarian tumor.

Type of tumor	Mean size in cm	No of cases in each size range				Total no of cases
		≤4	5-9	10-19	≥20	
Benign tumors						
Serous cystadenoma	12	0	2	3	0	5
Serous cystadeno fibroma	15	0	0	1	0	1
Papillary serous cystadenoma	12.78	0	2	2	3	7
Mucinous cystadenoma	22	0	0	4	7	11
Papillary mucinous cystadenoma	23.33	0	0	2	1	3
Dermoid cysts	9.9	0	5	6	0	11
Mature cystic terratoma	15.25	0	2	1	1	4
Granulosa cell tumor	15	0	0	2	0	2
Total		0	11 (25%)	21 (47.72%)	12 (27.27%)	44
Borderline tumor						
Serous borderline epithelial tumor	8	0	1	0	0	1
Borderline mucinous tumor	19	0	0	1	1	2
Total		**0**	**1**	**1**	**1**	**3**
Malignant tumors						
Serous cystadeno carcinoma	12.28	0	2	4	1	7
Papillary serous cystadeno carcinoma	13.46	0	7	19	5	31
Mucinous cystadeno carcinoma	15.5	1	1	7	3	12
Papillary mucinous cystadeno carcinoma	10.4	0	2	3	0	5
Dysgerminoma	12	0	0	1	0	1
Yolk sac tumor	10	0	0	1	0	1
Sertoli-leydig cell tumor	20	0	0	0	1	1
Kruken berg tumor	17.33	0	0	1	2	3
Total		1 (1.6%)	12 (19.67%)	36 (59%)	12 (19.67%)	61

Among the patients with benign tumors the most common presenting symptom was pain abdomen 35/44 (79.55%) followed by mass per abdomen 14/44 (31.81%). Out of 44 cases with benign tumor 8 (18.18%) developed ascites and 26 (81.8%) had no ascites. Borderline tumor cases had no ascites.

Amongst those developed ascites 50% developed upto 5liter or less and 50% developed more than 5 liter of ascites. Out of 61 malignant ovarian tumor cases 41 (67.2%) developed ascites with 57.38% upto 5liters and 14.64% more than 5liters and 20 (32.8%) had no ascites.

Patients among benign tumors who presented within one month of onset of symptoms were 35/44 (52.27%). patients with malignant ovarian tumors who presented within one month of onset of symptoms were 16/61 (26.23%). Maximum cases of the malignant tumors presented at stage III (60.66%) and out of which majority were at stage IIIB.

Table 6: Relation between the presenting symptoms and ovarian tumor.

Clinical presentation	Benign ovarian tumor	Malignant ovarian tumor
Swelling of abdomen	19 (43.18%)	43 (70.49%)
Mass per abdomen	14 (31.81%)	28 (45.9%)
Ascites	8 (18.18%)	35 (57.38%)
Pain abdomen	35 (79.55%)	47 (77.05%)
Menstrual disorders	4 (9.1%)	10 (16.4%)
Gastrointestinal symptoms	7 (15.91%)	18 (29.5%)
Urinary symptoms	0	23 (28%)
weakness	2 (4.55%)	10 (16.4%)

Majority of the benign tumors (63.63%) are cystic and majority of the malignant tumors (37.7%) are solid.

20.45% of benign tumors were variegated whereas 26.22% of malignant tumors are variegated. 25% of the benign tumors are unilocular whereas 18.3% of malignant tumors are unilocular. majority of surface epithelial tumors 41 (48.23%) were cystic and unilateral 73 (85.88%). Most of the germ cell tumors are variegated (47.5%) and unilateral (94.11%).

Table 7: Stage of ovarian tumor.

Stage		No of cases	With ascites	Without ascites		Total
Stage-I	A	07	1	6		7 (11.47%)
	B	0				
	C1	0				
	C2	0				
	C3	0				
Stage-II	A	4	3	1	4/61 (1.55%)	7 (11.47%)
	B	3	3		3/61 (4.9%)	
Stage-III	A1	5	4	1	5/61 (8.2%)	37 (60.66%)
	A2	13	8	5	13/61 (21.3%)	
	B	15	13 (31.7%)	2	15/61 (24.6%)	
	C	4	2	2	4/61 (6.55%)	
Stage-IV	A	8	6	2	8/61 (13.1%)	10 (16.4%)
	B	2	1	1	2/61 (3.28%)	
Total			41	20		61

In the present study two cases of ovarian tumor was observed during pregnancy, one papillay serous cystadenocarcinoma and the other sertoli-leydig cell tumor. Most of the patient were underwent laparotomy or cytoreductive surgery and only biopsy. Chemotherapy was given depending upon the surgical stage and after histopathological confirmation, with six cycle cyclophosphamide and cisplatin regimen at 21 days interval.

Serum CA-125 level of the ovarian neoplasm cases were extensively studied and found that its diagnostic relevant to be controversial, but gradual reduction of of its serum level was seen after each cycle of chemotherapy in case of malignant ovarian tumors. At the end of two year study 8 patient are on followup chemotherapy and 12 patient died.

DISCUSSION

The clinicopathological profile of the ovarian tunmors diagnosed and operated at our institution during the past two years were analyzed. The clinical parameters like age at diagnosis, association with parity, presenting symptoms, duration of symptoms, ascites, stage of the disease, size, consistency, and bilaterality of ovarian tumors were compared in relation to the histological type of the tumor.

Ovarian tumor in relation to different age group

In the present study 57.4% of ovarian tumors were found in women of reproductive age group, 41.7% in the post menopausal women and only 0.9% in premenarcheal children. Scully at al described that approximately 2/3rd of ovarian tumors occurred in the reproductive age group and under 5% occur in children.[4]

One ovarian tumor found in premenercheal children was dermoid cyst. Malhotra N described that germ cell tumors occur prior to puberty or in early adult life.[5] As per this study germ cell tumors accounted for (5/7) 71.43% of tumors among the women under the age of 20. Padubidri et al described simple dermoid cyst have a maximum age incidence between 40 and 50 years.[6] The tumor may however arise at any age. As per this study 10 out of 11 dermoid cyst occurred with in age 50 years and one dermoid cyst occurred at the age of 65 years.

Relationship between histological type and age of the patient

In the present study 49.07% of ovarian tumors were found in the age group of 21 and 45 years, 33.55% were found in the age group of 46-55 years, 8.3% were found between the age group of 56-65 years and 2.8% above 66 years and 6.5% below 20 years. Kuldeep[2] et al also reported that majority of the tumors occurs between the reproductive age group.

In the present study, the mean age at diagnosis of various ovarian tumors are different. Among benign tumors the mean age at diagnosis is 42.84 years and the mean age at diagnosis for the borderline and malignant tumor are 46.66 years and 46.55 years respectively. Marcela F paes[3] et al in a study reported that mean age at diagnosis was

54.67±13.84 for ovarian cancer, 46.15±11.15 for borderline tumor, 42.01±15.06 for adenomas. The mean age of the patient at diagnosis is comparable with their study.

Relationship between the histological type and parity

In the present study, it was observed that 22.22% of cases with ovarian tumors were nulliparous and 77.78%were multiparous. Saradha SO et al in a study reported that parity is not a significant risk factor ovarian neoplasm.[7]

In the present study among the benign tumors 27.27% case were nulliparous and among the malignant tumors 10.03% were nulliparous.

Relationship between the presenting symptoms and the ovarian tumor

In the present study, the common presenting symptoms among benign ovarian tumors were pain abdomen 79.55%. Swelling of abdomen 43.18% and mass per abdomen 18.18% as reported by padubidri et al.[6] Normally the benign ovarian tumors cause no abdominal pain and are comfortably placed in the abdominal cavity which is distensible.

Breen JL in a study reported that Pelvic pain can result from peritoneal stretching, pressure on adjacent organ, rupture or hemorrhage into the cyst and the common cause is the torsion.[8]

In the present study, the common presenting symptoms with malignant ovarian tumor were pain abdomen 77.05%, swelling of abdomen 70.49%, ascites 57.38%, mass per abdomen 45.9% and constitutional symptoms like gastro intestinal symptoms, weakness, menstrual disorders and urinary symptoms are 29.5%, 16.4%, 16.4%, 3.28% respectively. Sharadha et al in a study reported that abdominal pain followed by abnormal menstrual pattern was the predominant presenting symptom in patients with both non neoplastic and benign ovarian masses on the contrary.[7] Malignant group predominantly presented with vague abdominal symptoms 42.9%, with pain abdomen only in 35.7%. Gray Levi et al described 15% of reproductive age patients present with menstrual abnormalities.[9]

Relation between ascites to the histological type of the tumor

In the present study of the benign ovarian tumors, ascites was detected in 8/44 (18.18%) of cases and (36/44) 81.8% didn't develop ascites.

Of the malignant tumors in (41/61) 67.2% cases ascites was seen out of which 35 (57.38%) had ascites upto 5 liters and 6 (14.64%) had ascites more than 5 liters. However, in 20 (32.8%) cases no ascites was seen. Among the malignant ovarian tumors who developed ascites maximum numbers of cases with ascites 13/41 (31.7%) was seen in stage IIIB. Garg R et al in a study of malignant ovarian tumor reported that 40.95% of malignant tumor present with ascites.[10]

Frequency of majority of ovarian tumors

In the present study, epithelial ovarian tumors constituted (85/108) 78.7%, germ cell tumors (17/108) 15.7%, sex-cord stromal tumors (3/108) 2.8% and metastatic tumors krukenberg tumors (3/108) 2.8%

Frequency of the subtype of common epithelial tumor

In the present study, it was observed that of the epithelial ovarian tumors the most common histological type was papillary serous cystadenocarcinoma 28.7% followed by mucinous cystadenocarcinoma 11.1%. Padubidri et al described most common among the serous epithelial tumor is the serous cystadenocarcinoma and accounts for 50% of all epithelial tumors.[6]

Frequency of benign borderline and malignant tumors among the epithelial tumors

In the present study the frequency of benign, borderline and malignant tumors was 40.74%, 2.78% and 56.48% respectively.

From the comparison, it is observed that proportionately increasing number of malignant ovarian tumors were encountered in this study. As the present study centre is a major rural based tertiary care institute in western odisha and large number of primary and secondary care institute are there around its periphery, most of the malignant referred cases are treated here.

Papillary serous cystadenocarcinoma (28.7%) is the most common epithelial ovarian cancer encountered among malignant tumors. Mucinous cystadenoma (10.2%) and dermoid cyst (10.2%) occurred in equal numbers among benign tumors.

Relationship between the consistency and histological type of the tumor

In the present study, out of the benign tumors 63.63% are cystic 15.9% are solid and 20.45% are mixed consistency. Out of total 28 cystic tumors mucinous cystadenoma 9/28 (32.14%) found to be commonest. Padubidri et al described that serous cystadenoma and cystadenocarcinoma are the most common cystic ovarian tumor.[6]

In the present study, of the malignant ovarian tumors 37.7%were solid, 31.14% and 26.22% were cystic and variegated respectively. Kuladeep et al in a study reported that majority of the malignant tumors are solid in consistency.[2]

Relationship between the locularity and histological type of the tumor

In the present study 25% of the benign tumor were unilocular and 36.36% were multilocular. Of the malignant tumors 70.58% were unilocular and 11.76% were multilocular.

Narendra malhotra et al described that in general benign lesions were unilateral, uniloculated, thin walled with no papillae or soilid areas.[5] In contrast malignant lesions were often multi colular, thick walled, thick septa and mixed consistency because of presence of solid areas.

Relationship between histological type and tumor size

In the present study, the mean diameter of the tumors was different. Majority of the ovarian tumors 53.7% were within 10-19 cm, out of which 47.72% of benign tumors are within 10-19 cm whereas 59% of malignant tumors are within 10-19 cm. Majority of the malignant tumors are larger than benign tumors.

Stage of the ovarian cancer

In the present study, it was observed that 60.66% of malignant ovarian tumors were presented in stage III. Stage I and stage II ovarian cancers accounted for 11.47% and 16.4% presented at stage IV. Out of the maximum number presented in stage III majority were seen in stage IIIB.

Complications

In the present study complications like torsion and infection were observed. Torsion of tumor were most commonly seen in dermoid cysts. In the study, youngest patient seen with dermoid cyst was at 10 years of age.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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