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Gynaecology

CLINICOPATHOLOGICAL STUDY OF OVARIAN NEOPLASMS

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ABSTRACT

Background: Worldwide, Ovarian cancer is the eighth most common form of cancer in women. In general, the highest incidence rates are found European and North American population groups, and the lowest rates in Sub-Sahara African population groups.

Objective : To find out the clinico-pathological features of patients with ovarian tumors in the population of this part of country with the hope that it will be of help to suspect the disease and diagnose them in earlier stages for over all better prognosis.

Materials and Methods: A cross-sectional study

Results : Maximum numbers of cases were within the age group of twenty one to forty five years , nullipara, multilocularity, bilaterality and solid components are often found with malignant ovarian tumors than their benign counterparts

Conclusion : Thorough clinico pathological evaluation with consideration of vague symptoms and suspiciousness in mind, are great tool in diagnosing earlier.

KEYWORDS : Ovarian cancer, Cross sectional study

INTRODUCTION

Ovary, the organ of procreation may turn into an organ of destruction when neoplastic. Ovarian neoplasms are often abused as 'silent killers' and they put a lot of challenge in such situations. A woman's risk of having ovarian tumor at birth is 1.5% and that of dying from ovarian cancer is almost 1%.Worldwide, ovarian cancer is the eighth most common form of cancer in women. In general, the highest incidence rates are found among European and North American population groups, and the lowest rates in Sub-Saharan African population groups. In India it is the third common cancer among women.

Around 75% of ovarian cancers are not diagnosed until it has advanced to stage III or IV, giving a five year survival rate of only 20%.[5] This statistics has not changed in last three decades primarily because of unsatisfactory screening tools.

Till now the exact etiology of the tumor is not established to take any precaution. Only some factors like genetic markers, ovulation induction drugs, ionizing radiation, oral contraceptives, parity and tubal ligation etc. are considered to be associated with cither increased or decreased risk. These factors are not enough to reduce the disease to any significant extent.

Though some non-specific or vague symptoms do appear in the earlier stage of the disease, unfortunately, these are easily overlooked and of the time attributed as diseases of some other organs or systems. Role of tumor markers are also not specific, therefore inadequate to screen the disease. Roles of diagnostic tools are also quite unsatisfactory in this context. Pathology of ovarian neoplasms is also one of the most complex areas of gynecology because of its largest variety than any other organ and wide distribution over all ages. So, thorough clinical and pathological evaluation of patients for any disease condition with a suspicious mind for ovarian tumors may be of great help in this context.

MATERIALS AND METHODS

The study entitled "Clinicopathological study of ovarian neoplasms" is an institution based, unicentric, and descriptive, cross-sectional study, conducted in the Department of Obstetrics and Gynecology, M.K.C.G. Medical College, Berhampur from November 2014 to April 2016.

Inclusion criteria

Those established as ovarian neoplasms.

Patients admitted for some other conditions but came out to be / associated with ovarian neoplasms were also included in study population.

Exclusion criteria

Those came out to be other diseases or non-neoplastic conditions of ovary during evaluation.

STUDY PLAN

All the cases recruited as per the above criteria had undergone thorough and meticulous history taking and clinical examination. After required investigations all underwent staging laparotomy followed by pathological evaluation of specimens.

OBSERVATION

TABLE-I Ovarian tumors in relation to different age groups

Histological type	Cases in different age groups			Total
	Premenarcheal children	Reproductive Age group	Postmenopausal women	
Benign tumors	01	24 (60%)	05(41.6%)	30
Borderline tumors	-	03 (7.5%)	-	03
Malignant tumors	01	13 (32.5%)	07 (58.4%)	21
Total	02(3.7%)	40 (74%)	12 (22.3%)	54

Out of 54 cases, 2 (3.7%) cases were seen in premenarcheal children, 40 (74%) cases in reproductive age and 12 (22.3%) in the postmenopausal women.

One of the cases of premenarcheal children was affected by malignant (germ cell) tumor, and other was affected by benign (germ cell) tumor.

TABLE -II Histological types of ovarian tumors in relation to age

Histological type	Mean Age (year)	Number of cases in each age range (years)					Total cases
		<20	21-45	46-55	56-65	>66	
Benign tumors	39	3	21	2	3	1	30
Serous cystadenoma	44	1	10	1	3	1	16
Mucinous cystadenoma	37		6	1			7
Mature cysticteratoma	30.3	2	4				6
Fibroma	45		1				1
Borderline tumors	32.6		3				3
Mucinous LMP	32		1				1
Serous LMP	33		2				2
Malignant tumors	41.63	3	11		3	4	21
Serous cystadenocarcinoma	55.8		3		1	3	7
Mucinous cystadenocarcinoma	46.3		2		1		3

Endodermal sinus tumor	18	1					1
Mixed germ cell tumor	37		1				1
Dysgerminoma	22.6	1	2				1
Endometrioid carcinoma	60				1		1
Immature cystic teratoma	19	1					1
Brenner's tumor	42		1				1
Granulosa cell tumor	45		1				1
Metastatic tumors	50.5		1			1	2
Total	40.7	6 11.1 %	35 64.8 %	2 3.7%	6 11.1 %	5 9.3%	54

Patients reported with a mean age of 40.7 years and a median age of 38 years (ranged from 13 years to 75 years). The mean ages at which diagnosis were made for benign tumors; borderline tumors and malignant tumors were 39 years, 32.6 years and 41.63 years respectively.

Out of total cases, 6 (11.1%) were below 20 years of age, 35 (64.8%) were between 21 to 45 years, 2 (3.7%) were between 46 to 55 years, 6 (11.1%) were between 56 to 65 years and 5 (9.3%) were above the age of 66 years. Epithelial stromal tumors and benign germ cell tumors were more frequently encountered within 21 to 45 years of age, whereas malignant germ cell tumors were encountered more below 20 years of age.

TABLE-III Histological types of ovarian tumor and parity

Histological type	Nullipara	Multipara	Total
Benign tumors	3(10%)	27 (90%)	30
Borderline tumors	2 (66.6%)	1 (33.4%)	3
Malignant tumors	3 (14.2%)	18(85.8%)	21
Total	8 (14.8%)	46 (85.2%)	54

As depicted above it was observed that out of 54 cases of ovarian tumors, 8 (14,8%) were nullipara and 46 (85.2%) were multipara. Of the benign tumors 10% were nullipara and 90% were multipara, whereas of the malignant tumors 14.2% were nullipara and 85.8% were multipara.

TABLE-IV Ovarian tumors and socioeconomic status

Social status	Number of cases	Percentage
Higher	2	3.7
Middle	17	31.4
Low	35	64.9
Total	54	100

As shown in the above table, in the present study ovarian tumors were observed in low socioeconomic group in 35 cases (64.9%), in middle socioeconomic group in 17 cases (31.4%) and in higher socioeconomic group in 2 cases (3.7%).

TABLE-V Relationship of family history, ovulation induction and oral contraceptives toovarian tumors

Factors to be considered with ovarian tumors	Associated		Not associated	
	No.	%	No.	%
Family history	2	3.7	52	96.3
Benign	-	-	30	57.8
Borderline	-	-	3	5.7
Malignant	2	100	19	36.5
H/O ovulation induction	2	3.7	52	96.3
Benign	1	50	29	55.9
Borderline	-	-	3	5.7
Malignant	1	50	20	38.4
H/O oral contraceptive	5	9.2	49	90.8
Benign	4	80	26	53
Borderline	-	-	3	7
Malignant	1	20	20	40
Pregnancy association	1	1.8	99	98.2

Among the cases associated with positive family history all the 2 cases (100%) were malignant whereas out of 52 cases without positive family history only 36.5% were malignant. Of the 2 cases associated with use of ovulation induction drugs one case (50%) was malignant whereas of the 52 cases not associated with use of ovulation induction drugs only 38.4% (20 cases) were malignant. Of the 5 cases having history of oral contraceptives one was malignant (20%) whereas of the 49 non-users 20 cases (40%) were malignant.

TABLE-VI Presenting symptoms and ovarian tumors

Presenting symptoms	Benign tumors	Borderline tumors	Malignant tumors
Specific symptoms			
Abdominal distension	11(34.3%)	2 (66.6%)	7 (36.8%)
Abdominal mass	20 (62.5%)	1 (33.3%)	7 (36.8%)
Abdominal pain	13 (40.6%)	1 (33.3%)	16(84%)
Bleeding P/V	3 (9.3%)		3 (15.7%)
Non specific symptoms			
Bloating	5 (15.6%)		4(21%)
Nausea	3 (9.3%)		4(21%)
Vomiting	1 (3.1%)		
Indigestion	1 (3.1%)		1 (5.2%)
Constipation	1 (3.1%)		
Urinary symptoms	1 (5.2%)		
Back ache	4(12%)	1 (33.3%)	2(10.5%0
Fatigue	2 (6%)	3 (15%)	
Asymptomatic	1 (3.1%)		

According to this table, most common symptom in benign, borderline and malignant tumors were abdominal mass in 20 cases(62.5%), abdominal distension in 2 cases(66.6%), abdominal pain in 16 cases (84%) respectively.

TABLE-VII Duration of symptoms and histological types of ovarian tumors

Histological type	Duration of symptoms			Total
	< 1 Month	1 - 6 Month	> 6 Months	
Benign tumors	4(13.3%)	17(56.6%)	9(30.1%)	30
Borderline tumors		3		3
Malignant tumors	4(19%)	15(71.5%)	2 (9.5%)	21

According to the above table duration of symptoms among benign tumors were less than or equal to one month in 4 cases (13.3%), one to six month in 17 cases (56%) and more than six month in 9 cases (30.1%). All the borderline tumors had duration of symptoms within one to six months. Whereas duration of symptoms among malignant tumors were less than or equal to one month in 4 cases (19%), one to six month in 15 cases (71.5%) and more than six month in 2 cases (9.5%).

TABLE-VIII Torsion in relation to ovarian tumors

Histological types	Number of cases	Percentage
Serous cystadenoma	2	28.5
Mucinous cystadenoma	1	14.3
Dysgerminoma	1	14.3
Mature cystic teratoma	3	42.9
Total	7	100

Of all ovarian tumors cases 7 presented with torsion and of them serous cystadenoma tumors were responsible in 2 cases, mucinous cystadenoma and dysgerminoma in one case (14.3%) each and mature cystic teratomas were responsible in 3 cases (42.9%).

TABLE-IX Ascites in relation to histological types and stages of ovarian tumors

Histological type	Cases without ascites	Cases with ascites	Cases with <0.5 liter of fluid	Cases with >0.5 liter of fluid	Total cases
Benign tumors	25(83.3%)	5(16.7%)	5	-	30
Borderline tumors	1 (33.4%)	2 (66.6%)	2	-	3
Malignant tumors	3 (14.2%)	18(85.8%)	6(33.3%)	12(66.7%)	21

Stage I	2 (50%)	2 (50%)	2	-	4
Stage II	1 (33.4%)	2(66.6%)	1 (50%)	1 (50%)	3
Stage III	-	9	3 (33.3%)	6 (66.7%)	9
Stage IV	-	3		3	3
Metastatic		2		2	2
Total	29(53.7%)	25 (46.3%)	13 (52%)	12(48%)	54

Of the 30 benign cases 5 cases (16.7%) had ascites and 25 cases (83.3%) were without ascites. Of the 3 borderline cases 2 cases (66.6%) had ascites and one case (33.4%) was without ascites. Of the 21malignant cases 18 (85.8%) had ascites and 3 (14.2%) had no ascites.

Of the cases having ascites, the amount of fluid was below 0.5 liter in 5 cases of benign tumors, 2 of the borderline tumors. Whereas out of 18 cases of malignant tumors having ascites, 6 cases (33.3%) had ascites below 0.5 liter and 12 cases (66.7%) had ascites above 0.5 liter.

Among the different stages of malignant tumors, 2 cases (50%) from stage I, 2 cases (66.7%) from stage II and all cases from stage II and IV had ascites. Of the malignant cases having ascites, the amount of fluid was below 0.5 liter in all 2 cases ofstage I, one case (33.3%) of stage H. Whereas the amount of fluid was above 0.5 liter in one case (50%) of stage n, 6 cases (66.7%) of stage III and all three cases of stage IV. All two cases of metastatic tumors had ascites and the amount of fluid was above 0.5 liter in all cases.

TABLE-X Stages of ovarian cancers

Stage	No. of Cases	Percentage
Stage I	4	21.0
Stage II	3	15.7
Stage in	9	47.3
Stage IV	3	16.0
Total	19	100.0

As described in the above table, of the 19 cases of malignant tumors, stage I, stage II, stage HI and stage IV were 4 (23.5), 3 (17.6%), 8 (47.2%), 1 (11.7%) respectively.

TABLE-XI Number of cases in relation to laterality

Histological Type	Unilateral Number (percentage)	Bilateral Number (percentage)
Benign tumors	25 (83.3)	5 (16.7)
Serous cystadenoma	13(81.25)	3(18.75)
Mutinous cystadenoma	6 (83.4)	1 (16.6)
Mature cystic teratoma	5 (83.3)	1 (16.7)
Fibroma	1	
Borderline	2 (66.6)	1 (33.4%)
Borderline seroul	1(50)	1(50)
Borderline mucinous	1	
Malignant tumors	13(61.9)	8(38.1)
Serous cystadenocarcinoma	3 (42.8)	4 (57.2)
Mucinous cystadenocarcinoma	2 (66.7)	1 (33.3)
Brenner tumor	1	
Endometrioid carcinoma	1	
Endodermal sinus tumor	1	
Mixed germ cell tumor	1	
Immature cystic teratoma	1	
Dysgerminoma	2 (66.6)	1 (33.4)
Granulosa cell tumor	1	
Metastatic tumors		2
Total	41(76)	13(24)

Of the metastatic tumors all two cases were found to be bilaterally involved.

TABLE-XII Number of cases in relation to the size and the histological type of ovarian tumor

Histological type	Mean size (cm)	No. of Cases in each size range (cm)			Total
		5 - 9	10 - 19	≥20	
Benign tumors	13.4	7	15	8	30
Serous cystadenoma	14	4	7	5	16
Mucinous cystadenoma	16.1	1	4	2	7
Mature cystic teratoma	11.3	2	3	1	6
Fibroma	15		1		1
Borderline tumors	13.6		3		3
Borderline serous	13		2		2
Borderline mucinous	15		1		1
Malignant tumors	13.5	7	9	5	21
Serous cystadenocarcinoma	11.4	3	3	1	7
Mucinous cystadenocarcinoma	18.6		2	1	3
Endometrioidtumor of ovary	12		1		1
Endodermal sinus tumor	8	1			1
Mixed germ cell tumor	7	1			1
Immature cystic teratoma	7	1			1
Dysgerminoma	10	1	2		1
Malignant Brenner tumor	20			1	1
Granulosa cell tumor	25			1	1
Metastatic tumors	16		1	1	2
Total	13.6	14	27	13	54

Mean diameters among benign, borderline and malignant rumors were 13.4 cm 13.6 cm and 13.5 cm respectively. Total mean diameter of all tumors was 13.6 cm. The mean diameters of serous cystadenoma, mucinous cystadenoma, mature cystic teratoma, fibroma, borderline serous, borderline mucinous, serous cystadenocarcinoma, mucinous cystadenocarcinoma, endometrioid tumor of ovary, endodermal sinus tumor, mixed germ cell tumor, immature cystic teratoma, dysgenninoma, malignant Brenner's tumor, granulosa cell tumor, and metastatic tumors were 14 cm, 16.1 cm, 10 cm, 11.3 cm, 15 cm, 13 cm, 15 cm, 11.4 cm, 18.6 cm, 12 cm, 8 cm, 7 cm, 7 cm, 10 cm, 20 cm, 25 cm, and 16 cm respectively.

Table XIII Number of cases in relation to consistency and Locularity of ovarian tumors

Histological type	Consistency			Locularity	
	Solid	Cystic	Variegated	Unilocular	Multilocular
Benign tumors	3.4%	80%	16.6%	76.6%	26.6%
Serous cystadenoma		16		14	2
Mucinous cystadenoma		6	1	4	3
Mature cystic teratoma		2	4	3	3
Fibroma	1				
Borderline tumors					
Borderline serous		2		2	
Borderline mucinous			1	1	
Malignant tumors	38%	9.5%	52.5%	14.2%	38%
Serous cystadenocarcinoma	3	1	3	1	3
Mucinous cystadenocarcinoma	1		2		2
Brenner's tumor	1				
Endometrioid carcinoma	1				
Endodermal sinus tumor			1		1
Mixed germ cell tumor			1		1
Immature cystic teratoma			1	1	
Dysgerminoma		1	2	1	
Granulosa cell tumor			1		1
Metastatic tumors	2				
Total	9	28	17	29	16
Percentage	16.6%	51.8%	31.6%	53.7%	29.6%

Gross examination of the tumors showed solid mass in 9 cases (16.6%), cystic in 30 cases (51.8%), variegated in 15 cases (27.7%), unilocular in 29 cases (53.7%) and multilocular in 16 cases 29.6%).

DISCUSSION

In the present study it was observed that ovarian tumor cases were more commonly reported in reproductive age group (74%), followed by postmenopausal age group (22.3%) and premenarcheal age group (3.7%), (Table-I). Similar observations were also made by Blaustein et al (1994), Breen et al (1997), Scully et al (1998),Berek (2002). It may be due to more number of women population in reproductive age group.

In the present study that, incidence of ovarian tumor was 11.1% below

20 year of age, 64.8% in 21 - 45 year of age, 3.7% in 46 - 55 year of age, 11.1% in 56 - 65 years of age and 9.3% above 66 year of age. The incidence of malignant ovarian tumors is 50% below 20 year of age, 31.4% in 21 - 45 year of age, 50% in 55 -65 year of age, and 80% above 66 year of age. Patients' age ranged from 13 to 75 years with a mean age of 40.7 years and median age of 38 years. The mean age of diagnosis for benign tumors, borderline tumors and malignant tumors are 39 year, 32 year and 41.63 year respectively (Table-II). These are consistent with the observations of Blaustein et al (1994), Breen et al (1997), Scully et al (1998), Sagawa et al (1999) and Berek (2002).

In the present study, of the benign tumors cystic, variegated, solid, unilocular and multilocular tumors were 80%, 16.6%, 3.4%, 76.6% and 26.6% respectively (Table-XIII). Of the malignant tumors cystic, variegated, solid, unilocular and multilocular were 9.5%, 52.5%, 38%, 14.2% and 38% respectively (Table-XIII). This is in accordance to the observation of Baily et al (1998), Fried et al (2001) and Nagell et al (2003) that malignant tumors are often associated with solid, variegated, multiloculated tumors with thick septa (>3mm), inner wall excrescence. But Rokitansky nodules in the wall of dermoid cysts are benign in nature.

SUMMARY AND CONCLUSION

In the present study "Clinicopathological study of ovarian neoplasms" fifty-four cases of ovarian tumors diagnosed and operated during the past two years are analyzed.

The age of patients ranged from 13 to 75 years with a mean age of 40.7 and a median age of thirty years. Maximum numbers of cases were within the age group of twenty one to forty five years (64.8%).The mean age of presentation was different among benign (39 years), borderline (32.6 years) and malignant (41.63 years).

Malignant tumors were more commonly found in nullipara, from low socioeconomic group, No specific etiologic factors could be identified. But the malignancy rate among women with positive family history was three fold than their counterparts without suggestive family history.

Only one case of ovarian tumor (mature cystic teratoma) was encountered during pregnancy incidentally. Still, it supports the observations of others that germ cell tumors are commonly encountered during pregnancy because of their occurrence in younger age groups.

Of the specific symptoms abdominal mass was commonest (62.5%) followed by abdominal pain (40.5%), distension (34.3%) among benign tumors whereas abdominal pain was the commonest presentation (84%) followed by distension (36.8%), mass (36.8%) among malignant tumors. Of the non-specific symptoms bloating was the commonest in both malignant and benign tumors followed by nausea, backache and fatigue.

Benign tumors have longer duration of symptoms in comparison to malignant tumors. Symptoms of malignant tumors evolved rapidly within a short period of time.

Torsion was more commonly encountered among mature cystic teratoma because of more fat content and mobility. Torsion is less commonly found among malignant tumors because of restricted mobility due to adhesion.

Ascites is more commonly associated with malignant ovarian tumor and more amount of ascitic fluid is found with advanced stage.

Of the major histological types of ovarian tumors, epithelial-stromal tumors were 38 (70.4%), sex cord stromal cell tumors are 2 (3.7%), germ cell tumors are 12 (22.2%) and metastatic tumors were 2 (3.7%). Of the total epithelial tumors, 31.5% were malignant, 8% are borderline tumors and 60.5% were benign in nature. Of the germ cell tumors mature cystic teratomas constituted 50%, dysgerminoma 25%, immature cystic teratoma, endodermal sinus tumor, and mixed germ cell tumor 8.3% each.

55.5% of cases were benign, 5.5% were of borderline type and 39% were of malignant type. There were 60.5% benign tumors, 8% borderline and 31.5% malignant tumors among epithelial stromal tumors.

In the present study it is observed that of the 17 primary malignant tumors of the ovaries 21% were in stage I, 15.7% in stage II, 47.3% in stage III and 16% in stage IV. This is this is why ovarian tumors are often detected late and abused as silent killers.

Size alone could not be correlated as an indicator of virulence of the ovarian tumor. But, multilocularity, bilaterality and solid components are often found with malignant ovarian tumors than their benign counterparts.

Conclusion:

Ovarian tumors are associated with factors like unidentified specific etiology, wider age distribution, late manifestation, vague symptoms, lack of appropriate screening tools and wider pathological entity, for which these tumors are challenging for the gynecologists.

Any patient from any age group may be susceptible to ovarian tumor for which thorough clinicopathological evaluation with consideration of vague symptoms and suspiciousness in mind, are the comer stones to clinch the diagnosis early.

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