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ORIGINAL ARTICLE

A STUDY OF OVARIAN TUMOURS: CLINICAL AND PATHOLOGICAL CORRELATION

M. Uma Devi[1], B. Suresh[2], T. Jyothirmayi[3], S. Venkata Ramana[4]

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ABSTRACT: OBJECTIVE: To study incidence age distribution of benign and malignant ovarian tumours in general population. **METHODS AND MATERIAL:** To study 120 patients with ovarian tumours in Govt. general hospital during June 2003 and June 2005. **RESULTS:** Clinical and pathological evaluation of all ovarian tumours was done and incidence, age distribution of various benign and malignant ovarian neoplasms were tabulated and compared with other studies. **CONCLUSIONS:** Most common ovarian tumours are benign tumours and serous cystadenoma is the commonest benign tumour and Serous cystadeno carcinoma is the most common malignant tumour.

KEYWORDS: Ovarian tumours, Incidence in general population, Age distribution.

INTRODUCTION: It's really a constant challenge to diagnose early and manage ovarian neoplasms since long time. No other single organ in the body can give rise to such a complex variety of tumors varying in structure, function and histiogenesis.

The incidence of carcinoma of ovary is variable and is the fourth leading cause of death in women (Roth et al 1985).[1] Ovary is a unique organ in the body, which can be a seat of large number of neoplasms benign, malignant, primary and secondary with wide spectrum of clinical and histological patterns. Moreover the clinical picture is further complicated by endocrine activity of some of the tumors. In no other organ have the neoplasm excelled the host organ size as in ovary (Javnoski 1928).

The clinical presentation of ovarian tumours varies from asymptomatic to an acute condition requiring emergency laparotomy. Excluding functioning ovarian tumors, rest of the tumors are amazingly quiet and rarely give rise to symptoms other than those induced mechanically by the size of the tumor. This feature makes them so dangerous as malignant once are often far advanced by the time they are diagnosed.

Ovarian tumors may be encountered in females of all ages. Youngest case reported in the literature was a thirty-week-old fetus with bilateral unclassified tumor and the Oldest being 92-year-old woman.

The peak incidence of benign ovarian tumors is 20–50 years and for malignant ovarian tumors 45-65 years. In children ovarian tumors account for 1% of all tumors. 20% of all tumors in the first decade of life are malignant tumors of germ cell origin (Abell et al 1965).[2] Approximately 75% of all ovarian tumors are benign and only 25% are malignant. (Janoski 1978).[3] Though incidence is less, mortality is higher than any other malignancy.

Of the various ovarian tumors 70-80 % is of epithelial origin, 10% are stromal origins 5% being germ cell origin and remainder fall in to other groups. The women's risk at birth of having

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ovarian cancer some time in her life is nearly 1.5% and that of dying due to it is almost 1% (Novak's).

The present study is undertaken to verify the incidence of various ovarian tumours in the region of Rayalasema districts ours is the main referral hospital in this region.

AIMS AND OBJECTIVES OF THE STUDY: The writing of this study is undertaken to assess the quantum of problem of ovarian tumours and its understanding in this geographic area that is within reach of Govt. General Hospital Kurnool with particular emphasis on

1. Incidence of ovarian tumours among gynecology out patients.
2. Age distribution of different ovarian tumours.
3. Incidence of benign and malignant ovarian tumours.
4. Incidence of individual tumours.
5. Mode of presentation.

MATERIALS AND METHODS: The Present study is for a period of 2 years that is from June 2003 to June 2005. The study included all women who are suspected to be suffering from ovarian pathology, attending gynecology out patient at Govt. General Hospital, Kurnool. After surgery, all the specimens were sent to department of pathology, Kurnool medical college Kurnool for histopathology confirmation.

RESULTS: The present study is under taken for a period of two tears i.e. June 2003 to June 2005. A total number of 120 cases of ovarian tumours have been admitted in the gynaecology department. All the cases have been evaluated and the results are tabulated as follows;

Period of Study	Total no. of Patients attended Gynaecology O.P	Total no. of Ovarian Tumours Diagnosed
June 2003 to June 2005	12,997	120(0.92%)

Table 1: Incidence of Ovarian Tumours among Gynaecology Out Patients

Among the 12,995 patients who attended gynaecology O.P. with various complaints 120 patients were diagnosed as having ovarian tumours and it gives an incidence rate of 0.92%.

Total no. of Ovarian Tumours	No. of Primary Tumours (%)	No. of Metastatic Tumours (%)
120	118(98.33)	2(1.66)

Table 2: Percentage of Primary and Secondary (Metastatic Tumours)

It is observed that primary ovarian tumours form the major no accounting for 98.33% (118 cases) and metastatic tumours only 1.66%(2).

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Total no. of ovarian tumours	No. of benign tumours (%)	No. of malignant tumours (%)
120	92(76.66%)	28(23.33%)

Table 3: Incidence of benign and malignant tumours

Benign ovarian tumours are more common than the malignant ovarian tumours in the present study. Benign tumours constituted 76.66% (92) and malignant tumours form a smaller percentage 23.33% (28).

Sl. No.	Type of Tumour	Total no. of cases	Incidence among total No. of tumours
1	Benign serous cyst adenoma	48	40%
2	Benign mucinous cystadenoma	24	20%
3	Benign cystic teratoma	18	15%
4	Fibroma	1	0.833%
5	Sertoli-leydig cell tumour	1	0.833%

Table 4: Incidence of individual Benign Ovarian tumours

Sl. No.	Type of tumour	No. of cases	Incidence among total ovarian tumors
1	Serous cystadeno carcinoma	10	8.33%
2	Mucinous carcinoma	8	6.66%
3	Endometroid carcinoma	1	0.833%
4	Granulose cell tumour	1	0.833%
5	Immature teratoma	1	0.833%
6	Dysgerminoma	2	1.66%
.7	Yolk sac tumour	1	0.833%
8	Embryonal carcinoma	1	0.833%
9	Leiomyosarcoma	1	0.833%
10	Metastatic tumours	2	1.66%

Table 5: Incidence of individual Malignant tumours

Among the 92 benign tumours serouscystadenomas ranked first constituting about 40% of all ovarian tumours and 52.179% of all benign tumours. Rare tumour in tumours this series is sertoli leydig cell tumour forming 0.833%

Among the 28 malignant tumours, serous cystadenocarcinomas are the commonest tumours forming 8.33% of all ovarian tumours rarest malignant tumour in the present study is leiomyosarcoma.

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Sl. No.	Type of Tumours	Benign tumours no	Percentage	Malignant tumours no.	Percentage
1	Surface epithelial tumours	72	60%	20	17.5%
2	Germ cell tumours	18	15%	5	3.33%
3	Sex cord stromal tumours	2	1.66%	1	0.33%
4	Metastatic tumours			2	1.666%
	Total	**92**	**76.66%**	**28**	**23.33%**

Table 6: Frequency distribution of histiogenetic origin of ovarian tumours

It is observed that surface epithelial cell tumours are the commonest tumours either benign 60% or malignant 17.5% and germ cell tumours are the next common group of tumours accounting for 18.33% of all tumours. The least common tumours are the secondary tumours forming only 1.66%.

Sl. No.	Type of the tumour	Min age	Max age	0-10	11-20	21-30	31-40	41-50	51-60	61.	Total
1	Serous tumours										
a	Benign	18	65		1	6	25	12	2	2	48
b	Border line	42						1			1
c	Malignant	46	60					3	5	1	9
2	Mucinous tumours										
a	Benign	17	55		2	5	12	4		1	24
b	Borderline	45						1			1
c	Malignant	25	68			1		2	3	1	7
3	Endometroid										
a	Benign										
b	Malignant	49						1			1
4	Leiomyo- sarcoma	53							1		1
	Total										**92**

Table 7: Age distribution of epithelial tumours

Sl. no.	Type of Tumour	Min age	Max age	0-10 years	11-20	21-30	31-40	41-50	51-60	Total
1	Dysgerminoma	25	28			2				2
2	Yolk sac tumour	16			1					1
3	Embryonal carcinoma	29	-			1				1
4	Choriocarcinoma	-	-	-	-	-	-	-	-	-

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5	Teratomas									
	Benign cystic	8	55	2	7	5	2	1	1	18
	Immature/malignant	23				1				1

Table 8: Age distribution of germ cell tumours

Among the 23 germ cell tumours, teratoma constitute major group of 78.26%. Most of the germ cell tumours noted in the first two decades of life. Youngest patient in the present study is 8-year-old girl with benign cystic teratoma. Age incidence of these tumours ranged 8-55 years

Sl. No.	Type of tumour	Min age	Max age	0-10	11-20	21-30	31-40	41-50	Total
1	Granulose cell tumour	34	-	-	-	-	1	-	1
2	Sertoli leydig cell tumour	18	-	-	1	-	-	-	1
3	Fibro-thecoma -	-	-	-	-	-	-	-	-
	Fibroma	35					1		1
	Thecoma	-	-	-	-	-	-	-	-

Table 9: Age distribution of sex cord stromal tumours

Only 3 cases of sex cord stromal tumours have been identified in the present study. Age incidence of these tumours ranged from 18 –35 years.

Sl. No.	Age group of the patient	Benign tumours (no. of cases	Percentage	Malignant Tumours (no.)	Percentage
1	0-10	2	1.66%	-	-
2	11-20	11	9.66%	3	2.5%
3	21-30	16	13.33%	3	2.5%
4	31-40	39	32.5%	7	5.83%
5	41-50	17	14.16%	12	10%
6	51-60	5	4.16%	1	0.833%
7	61-70	2	1.66%	2	1.66%
		92	76.66%	28	23.33%

Table 10: Age distribution of benign and malignant tumours

It is observed that most of the benign tumours are encountered between 20 and40 (59.99%) years and malignant tumours are seen after 40 years age (12.49%). Malignant tumours noted in the in the younger age group belongs to germ cell tumours.

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Sl. No.	Age of the patient	Benign Tumour	Malignant Tumuor
1	Youngest	Benign cystic teratoma at 8 years	Yolk sac tumour at 16 years
2	Oldest patient	Serous cystadenoma at 65 yrs	Mucinous cystadeno carcinoma at 68 yrs

Table 11: Youngest and oldest patients in the present study

Sl. No.	Clinical presentation	No. of cases	Incidence of symptoms
1	Mass per abdomen	81	67.5%
2	Vague pain abdomen/ discomfort	21	17.5%
3	Acute pain abdomen	9	7.5%
4	Ascites and distension of abdomen	13	10.833%
5	Menstrual irregularities	2	1.66%
6	Symptoms of virilization	1	0.833%
7	Bladder and bowel disturbances	7	5.633%
8	Loss of appetite and weight	5	4.16%

Table 12: Mode of presentation

It is observed that most common mode of presentation is mass per abdomen; among 120 patients 81 were presented with mass per abdomen. The next common symptom being vague pain abdomen seen in 21 patients.

It is observed that surface epithelial cell tumours are the commonest tumours either benign 60% or malignant 17.5% and germ cell tumours are the next common group of tumours accounting for 18.33% of all tumours. The least common tumours are the secondary tumours forming only 1.66%.

DISCUSSION: Ovarian Tumours are clinically important tumours because of their mildness of symptoms till advanced stage. The frequency and distribution of these tumours are based on several analyses. The present study is compared with the study of Verma & Bhatiya (1981)[4] Misra Rk et al (1991)[5] And Veena Maheswari et al (1994).[6]

Sl. No.	Name of the tumour	Verma & Bhatiya et al 1981	Misra R. K. et al 1991	Maheswari et al 1994	Present study
1	Benign serous tumours	26.00%	48.49%	32.46%	40%
2	Malignant serous tumours	5.2%	7.32%	5.2%	8.33%
3	Benign mucinous tumours	19.1%	16.16%	14.55%	20%

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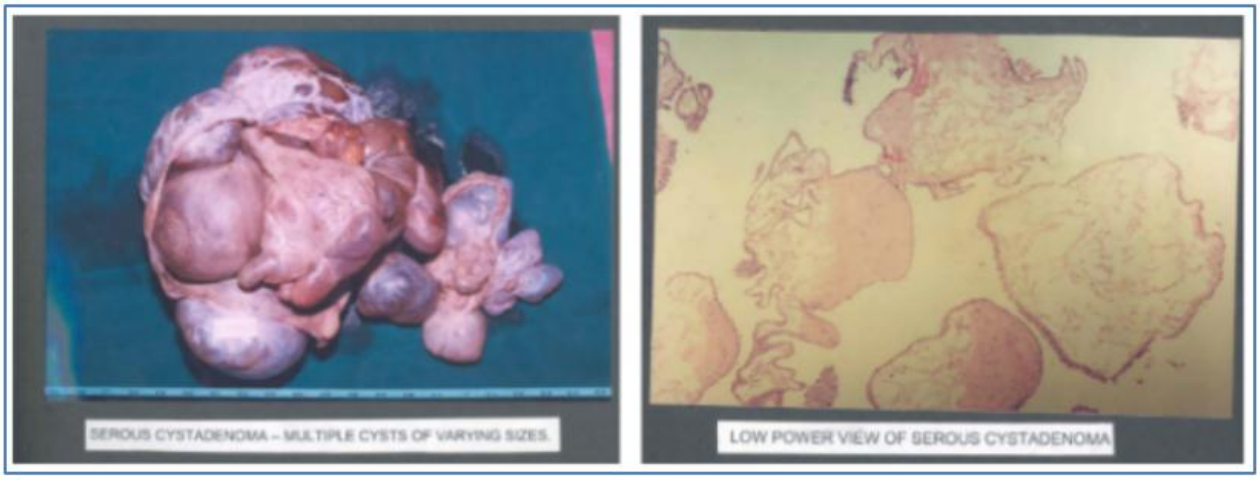
4	Malignant mucinous tumours	8.2%	2.53%	8.83%	6.66%
5	Endometroid carcinoma	3.7%	0.43%	2.34%	0.33%
6	Clear cell tumours	0.3%		0.52%	-
7	Benign Brenner	0.55	0.21%	0.25%	-
8	Malignant brenners tumour	0.3	_	0.52	_
9	Mixed epithelial tumours	0.3	0.64	_	_
10	Undifferentiated	1.4	_	1.04	

Table 13: Comparative incidence of various epithelial tumours

Surface Epithelial Tumours: This type of tumours constituted about 76.65% of all ovarian tumours. These tumours most commonly found in 3rd and 4th decades of life. The most common presenting symptom was mass per abdomen.

Serous Tumours: Serous tumours were the most common tumours among all ovarian tumours constituting 40%. They accounted for 42.47% of all surface tumours and 55.57% of all benign tumors similar observations were made by misra rk et al in 1994.[5] Among 58 cases 45 cases were benign (82.75%), one case was borderline malignant (1.72%) and 10 cases were malignant tumours (15.5). most of these tumours noticed in 3rd and 4th decades with mass per abdomen and vague abdominal pain as main presenting symptoms. Most of the tumours were cystic with glistening surface and clear serous fluid inside. Some of the serous tumours are of low malignant potential. The incidence of low malignant potential tumours was low i.e., 1.724% of all serous tumours. It was identical to the study by Prabhakar et al in 1985 where the incidence was 2.85%.



Serous Cystadenocarcinoma: These tumours were the most frequent malignant tumours of the ovary constituting 8.33% of all ovarian tumours. They were most common malignant epithelial tumours. Most of the patients presented at advanced stage with extensive involvement of omentum and other viscera. Bi laterality is noted in 2 cases. These observations were similar to the study by Misra RK et al in 1991.

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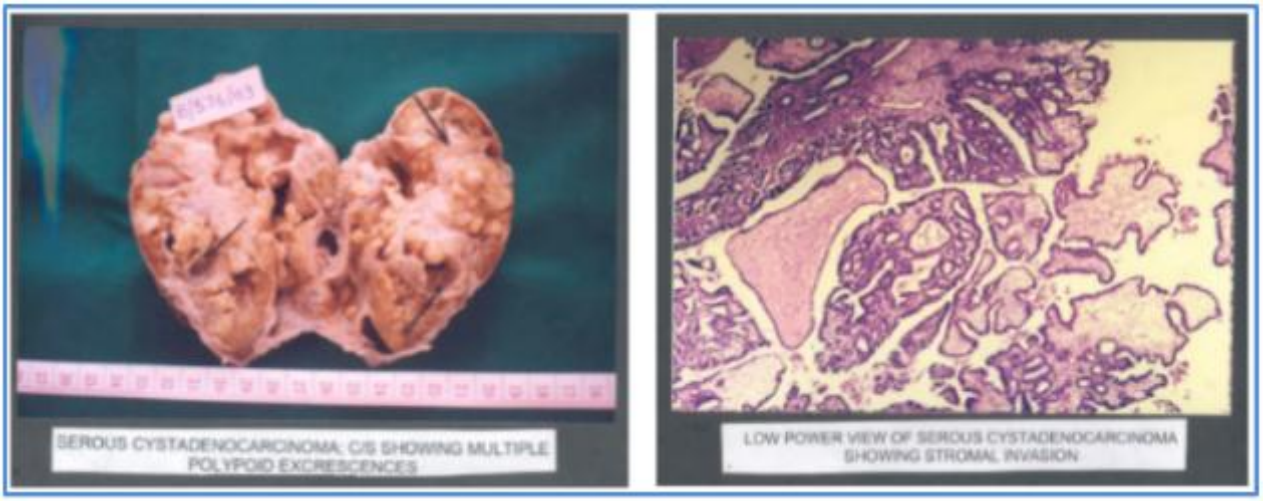
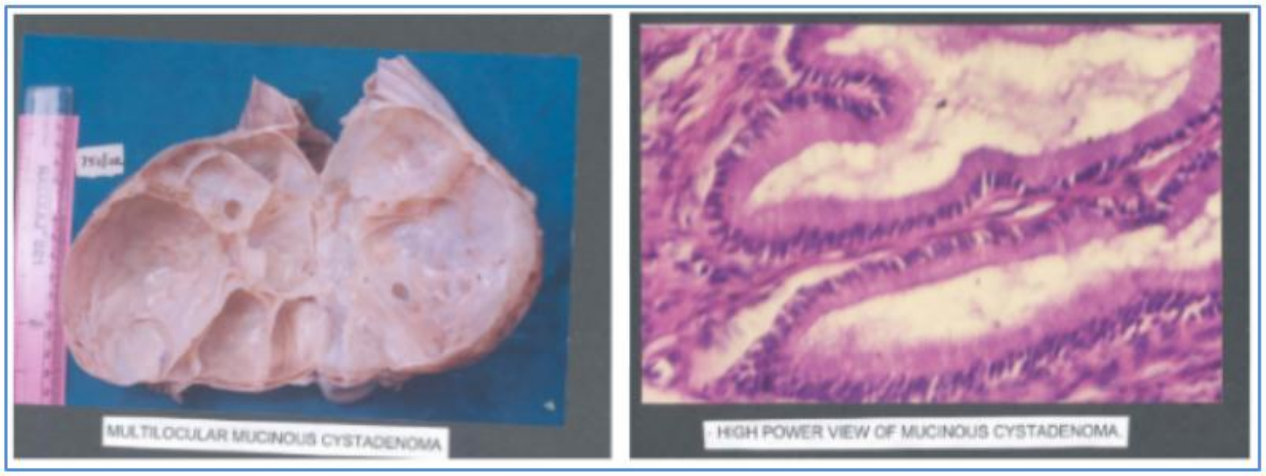


Mucinous Tumours: Mucinous cyatadenomas were the second common types of all ovarian tumours. In our study they constituted 26.66% of all ovarian tumours and 34.78% of all surface epithelial tumours. Among 32 mucinous tumours 24 were benign, 1 case was borderline and 7 were malignant. These results were similar to the reports by Verma and Bhatiya in 1981. These tumours were much larger in size and many as74.12% of them attained 15 cms or more size. These tumours are multilocular with mucinous material. Most of these tumours were also presented in advanced age. One case of papillary mucinous cystadenocarcinoma presented at younger age of 25 years. Bilaterality is noted in 2 cases of malignant ovarian tumours.

In our study benign mucinous tumours were noticed commonly during 3rd and 4th decade and the malignant mucinous tumours were in a decade later than benign tumours.



Mucinous Cyatadenocarcinoma: They constituted 6.66% of all ovarian tumours. Similar observations were made by Tandon et al in 1981[7] the above compared studies the incidence of

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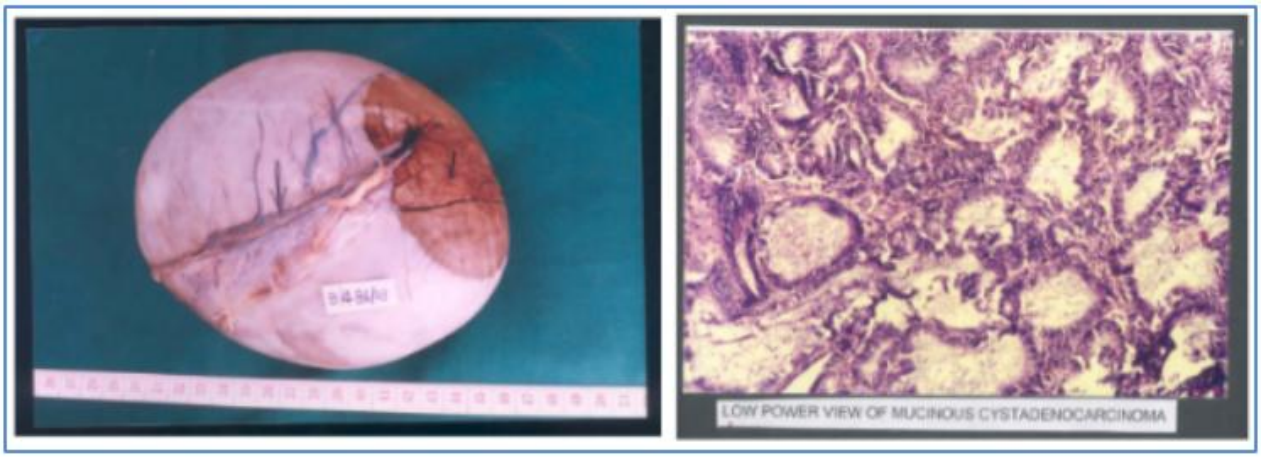
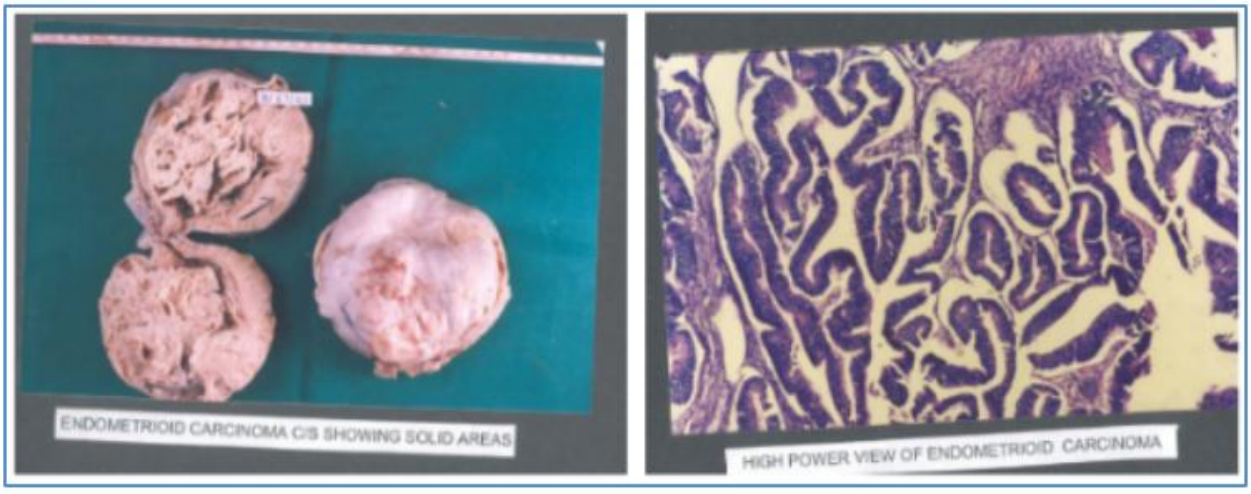
mucinous adenocarcinoma range between 2.58% by Misra RK et al[5] to 8.2% by Verma and Bhatia study. In our study the results fall in between the two studies.



Endometrioid Tumours: In our study endometroid tumours constituted 0.833% of all ovarian tumours and 1.08% of all surface epithelial tumours. The incidence of endometroid tumours correlated with study of Misra rk et al.[5] The nature of the tumour in the study was endometroid carcinoma.



Sl. No.	Type of Tumour	Tandon et al 1981	Verma et al 1981	Misra RK et al 1991	Our study
1	Dysgerminoma	2%	1.5%	3.o1%	1.66%
2	Endodermal sinus tumour	-	-	-	0.833%
3	Embryonal carcinoma	-	-	-	0.833%
4	Teratomas				
a	. Benign teratoma	13%	17.3%	13.5%	15%
b	Immature teratoma	3%	0.3%	1.07%	-
c	Malignant teratoma	2%	0.5%	-	0.83%
d	Struma ovarii	1%	-	-	-

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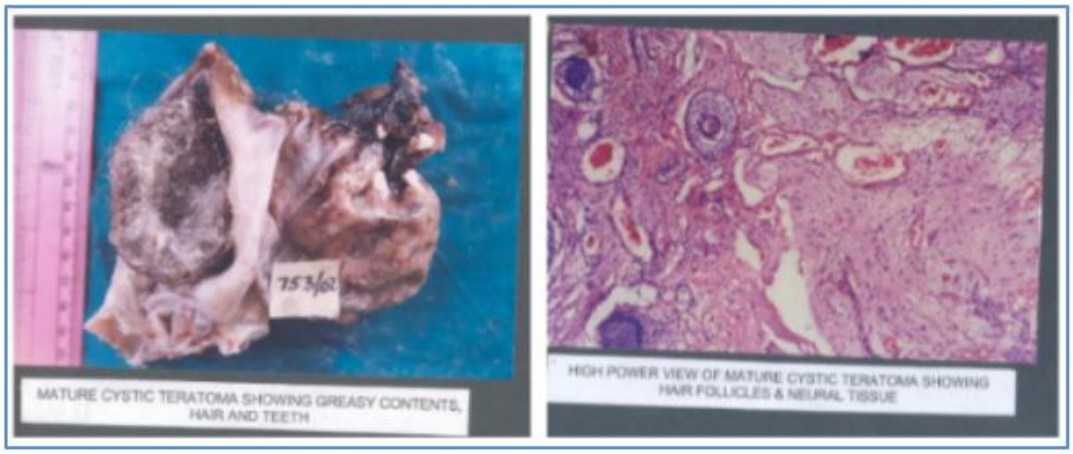
5	Mixed germ cell tumour	-	0.3%	0.21%	-
	Total	**21%**	**21.1%**	**18.29%**	**1066%**

Table 14: Comparative incidence of germ cell tumours

Germ Cell Tumours: These tumours constituted about 19.66% of all ovarian tumours in the present study. They are 3 rd most common types of tumours in these tumours comprising of 23 cases. About 155 of them are benign teratomas. The results correlated with study of both Verma & Bhatiya et al 1981 and Misra Rk et al 1991 study.

Benign Teratoma: These tumours formed (18 cases). 15% of all ovarian tumours. Similar observations noted in the above compared studies of Verma & Bhatiya 1981, Tandon et al1981 and Misra Rk et al 1991. These tumours were seen mostly in the young and early reproductive age groups. Mostly they are unilateral, cystic and typically composed of mature epidermal elements like fat, cartilage, bone, teeth, hair, glia, and respiratory epithelium. Careful examination was made to make out immature and malignant change. In the present study, youngest patient was an eight-year-old girl with unilateral benign cystic teratoma. One case of mature teratoma noted in postmenopausal woman of 53 years. One case was found to a dermoid with squamous cell malignant changes. One case of bilateral dermoid cyst was seen in this study.



Dysgerminoma: in our study two cases of dysgerminoma were noted constituting about 1.66% of all ovarian tumours and 7.14 % of malignant ovarian tumours. This is the most common germ cell malignancy in our study. The study results correlated with the studies of Verma and Bhatia 1981 and Tanden et al 1981. These are the only germ cell tumours which have a propensity for bilaterality (Novak). In our study both the tumours were noted in the 2nd decade with the characteristic features like uniform masses with rubbery consistency and yellowish colour.

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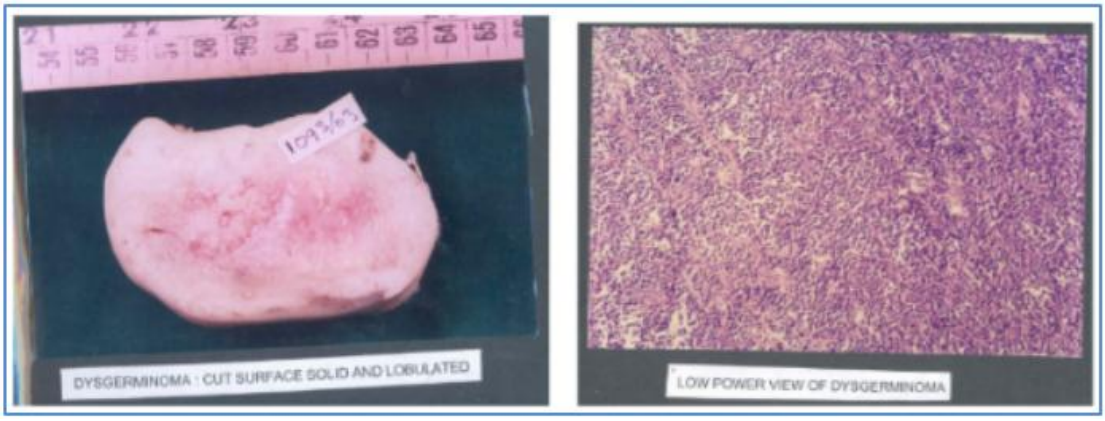
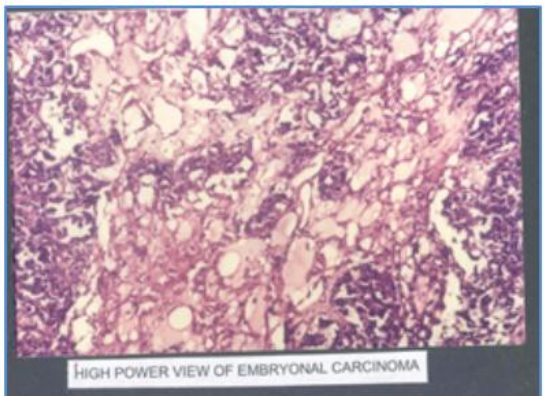


Yolk Sac Tumours: In our study only one case (0.83%) is diagnosed as yolk sac tumour. The age of the patient is 15 years and not attained menarche. The patient presented with mass per abdomen. According to Novak the median age of these tumours is 16-18 years and 1/3rd of the patients are premenarchal at the time of diagnosis. Our results correlated with Verma and Bhatia 1981 and Misra Rk et al 1991 studies.

Embryonal Carcinoma: In our study one case of embryonal carcinoma was detected constituting 0.83% of all ovarian tumors.



Sl. No.	Name of the tumors	Tandon et al 1981	Verma & Bhatia 1981	Misra R. K et al 1991	Present study
1	Granulose cell tumour	5%	5.9%	3.01%	0.833%
2	Thecoma	1%	-	0.21%	-
3	Fibroma	3%	-	0.43%	0.833%
4	Sertoli leydig cell tumour	4%	1%	0.64%	0.833%
5	Mixed stromal tumours	-	0.3%	-	-
	Total	13%	7.2%	4.29%	2.5%

Table 15: Comparative incidence of sex cord stromal tumours

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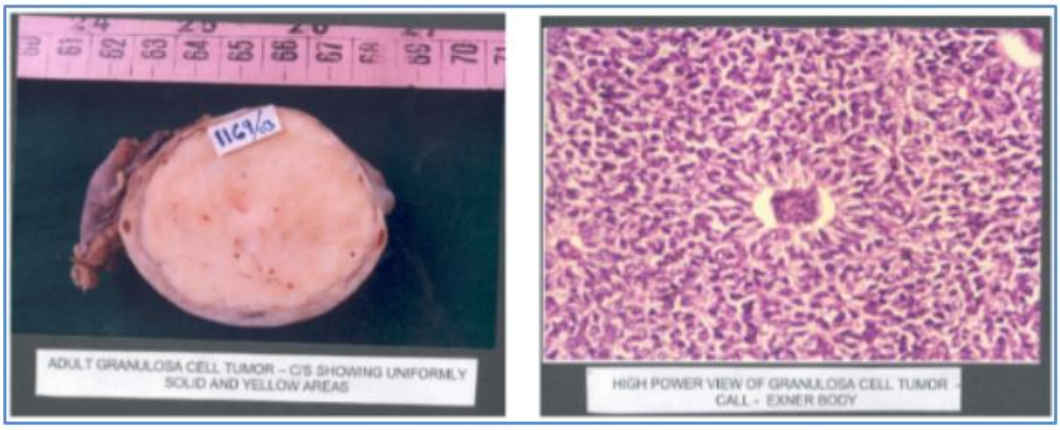
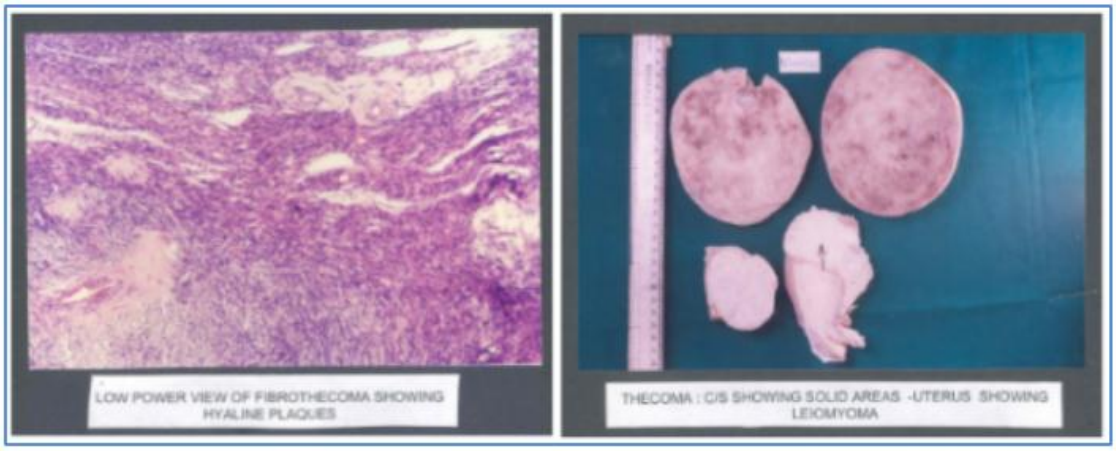
Sex Cord Stromal Tumours: These tumours account for 5-8% of malignant ovarian tumours (Novak). In our study 3 cases of sex cord stromal tumours is diagnosed constituting about 2.5% of all ovarian tumours. One case of granulose cell tumors, one fibroma and one sertoli leydig cell tumour were diagnosed in our study occurring in equal frequencies.

Granulose Cell Tumours: in the present study one case of granulose cell tumours was diagnosed constituting 3.5% of all ovarian malignant tumours. The tumour presented with solid mass with variable consistency and seen in third decade of life.



Fibroma: Fibroma constituted 0.83 %of all ovarian tumours. Similar observations were made by Misra Rk et al in 1991.



Sertoli Leydig Cell Tumours: these constituted 0.83% of all ovarian tumours in our study. These rare tumours constitute less than 0.2% of ovarian cancers (Novak). Our case is an 18 year old patient presented with symptoms of virilization.

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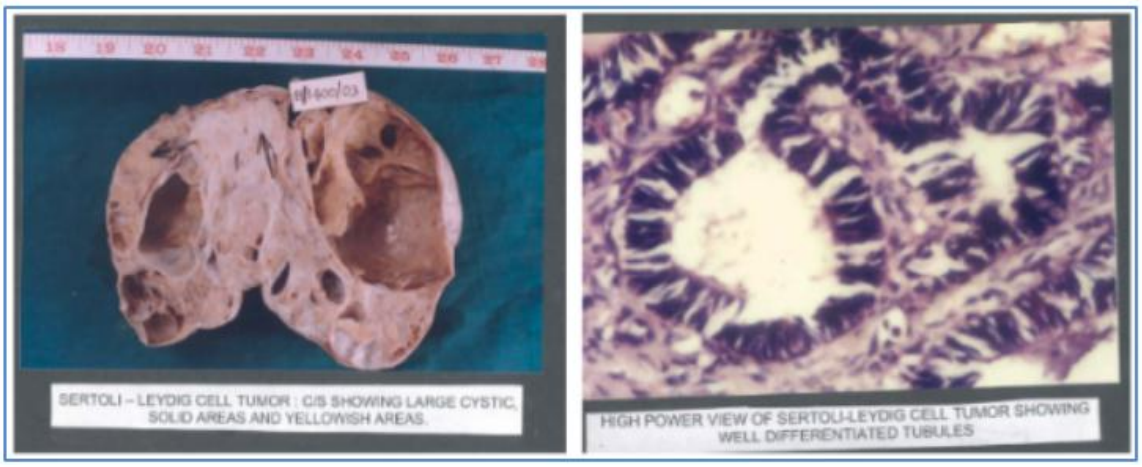
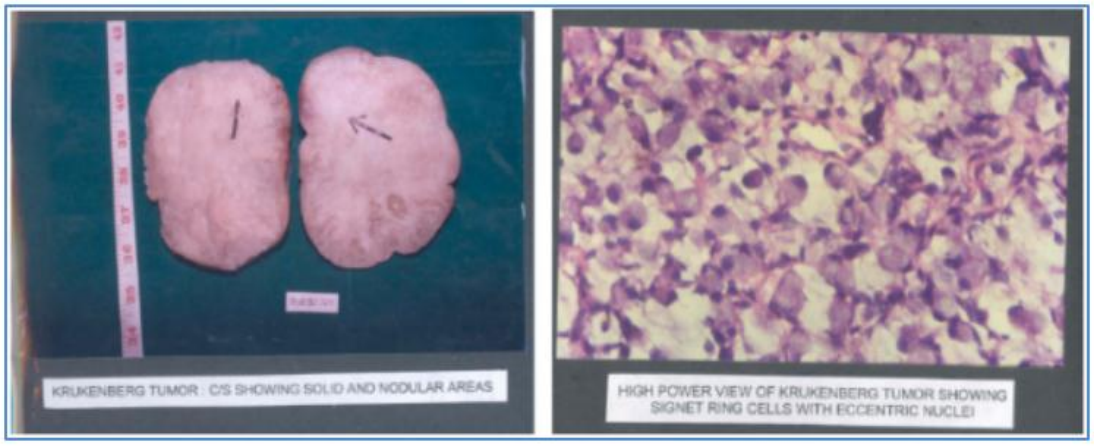


Metastatic Ovarian Tumours: In our study these constituted 1.66% of all ovarian tumours. Verma and bhatia reported a higher incidence of metastatic ovarian tumours. Two cases in our study were krukenberg tumours. The incidence is similar with the studies of Tandon et al 1981 and Misra Rk et al.1991.



SUMMARY AND CONCLUSIONS:

- The present study is done during two years period i.e. June 2003 to June 2005.
- Total no of 120 cases of ovarian tumours were diagnosed out of 12997 patients who have attended gynaecology out-patient department giving an incidence of 0.92%
- Out of 120 ovarian tumours 118(98.33%) cases were primary ovarian tumours and 2(1.67%) were secondary metastatic tumours.
- The incidence of benign ovarian tumours was 76.66% (92cases).
- Incidence of malignant tumours was 23.34% (28cases) in this study.
- Commonest benign tumour observed was serous cystadenoma of all tumours with an incidence of 40%.

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- Most common malignant tumour was serous cystadeno carcinoma with an incidence of 9.66%
- Out of 120cases, surface epithelial tumours were and the commonest group with an incidence of 67.5%.
- The second common group was Germ cell tumours.
- Most of the benign ovarian tumours were seen in 3rd and 4th decade of life, whereas malignant tumour were noticed a decade later.
- Most common clinical presentation was mass per abdomen (67%).
- Majority of the tumours were seen in with low parity (Nuliiparous or less than 2 children).

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AUTHORS:

1. M. Uma Devi
2. B. Suresh
3. T. Jyothirmayi
4. S. Venkata Ramana

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Obstetrics & Gynecology, Government General Hospital, Kurnool.
2. Assistant Professor, Department of Radiology, Government General Hospital, Kurnool.
3. Professor & HOD, Department of Obstetrics & Gynecology, Department of Obstetrics & Gynecology, Government General Hospital, Kurnool.
4. Assistant Professor, Department of Obstetrics & Gynecology, Government General Hospital, Kurnool.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. M. Uma Devi,
Assistant Professor,
Department of Obstetrics & Gynecology,
Government General Hospital, Kurnool.
E-mail: umasuresh9298@gmail.com
suresh9298@yahoo.com

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