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HISTOPATHOLOGICAL SPECTRUM OF OVARIAN TUMOURS IN REPRODUCTIVE AGE GROUP WOMEN OBSERVED AT A TERTIARY CARE HOSPITAL

Pathology

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ABSTRACT

Aim and objectives: Ovarian tumours present with a wide variation in clinical presentation and morphological features. Ovaries apart from being a common sites of primary tumors, they are frequent sites for metastasis from organs like stomach, colon and breast. The present work has been undertaken to study the common morphologic and histological types of ovarian tumours in reproductive age group women. **Materials and methods:** A prospective study s study is conducted for a period of 3 years (August 2010 to September 2013). 100 cases of ovarian tumors in reproductive age women were selected for the present study. Age between 15 and 49 was taken as reproductive age. 100 cases of ovarian tumours in reproductive age women were selected for the present study. Age between 15 and 49 was taken as reproductive age.**Results:** Out of the 100 cases 99 were primary ovarian tumours, 1 was secondary / metastatic tumour. Out if the 99 primary tumours 94 were benign, 1 was borderline tumour and 4 were malignant tumours. Most tumours occurred in age between 30-40 years. Of the 99 primary tumours 85(90.4%) were surface epithelial tumours, 10 (10.6%) were germ cell tumours and 4 (4.2%) were sex-cord stromal tumours. 1 metastatic tumour, were noted. Benign ovarian tumours are more common than malignant tumours. **Conclusion:** Surface epithelial tumours are the most common type of all ovarian tumours. Surface epithelial tumours are the most common benign and malignant tumours in reproductive age group. The incidence, clinical presentation of the different types of ovarian tumours is extremely variable. Histopathology is still the gold standard in diagnosing most of ovarian tumours. Studying the macroscopic and microscopic features of different ovarian tumours will enable proper categorization into definite morphologic type.

KEYWORDS

Ovarian tumours; Surface epithelial stromal tumour; Sex-cord stroma tumour; germ cell tumour; reproductive age.

INTRODUCTION

The ovaries are paired intra-pelvic organ of the female reproductive system performing a much important function in the body, the source of female fertility. Tumours of the ovary are common forms of neoplasia in women[1]. Among cancers of the female genital tract ovary is the third most common site of primary malignancy. In Indian females ovarian cancer accounts for 6% of all cancers in the female. Ovarian cancers account for 3% of all cancers in females is the fifth most common cause of death due to cancer in women the USA[2]. Risk factors for ovarian cancer are much less clear than for other genital tumors, but nulliparity, family history, and heritable mutation play a role in tumor development[3,4]. Women who have taken oral contraceptives or undergone tubal ligation have a reduced risk of developing ovarian cancer[5,6]. The most intriguing risk factors are genetic.

In the past different terminologies and nomenclature were used but at present WHO histological typing has been used which has removed dilemma of categorizing ovarian tumours[7]. Ovarian tumours present with a wide variation in clinical presentation and morphological features. Deep seated location of the tumours in the pelvis makes it difficult to apply simple diagnostic methods such as smears, biopsy or curettage as in Ca cervix and body of uterus making early diagnosis of ovarian tumours difficult for the gynaecologists.

Diagnosis of ovarian tumors can me made by combined efforts of departments like gynaecology,radiology and gold standard histopathological study, assisted by Immunohistochemistry and various tumor markers. The present work has been undertaken to study the common morphologic and histological types of ovarian tumours in reproductive age group women.

OBJECTIVES

To study the spectrum of ovarian tumors in reproductive age group. To study and characterize and subtype the ovarian tumors based on Histopathological features. To find out frequency of benign and malignant neoplasms of ovary in reproductive age group.

MATERIALS AND METHODS

A prospective study was conducted for a period of 3 years (October 2010 to September 2013).

Age between 15 and 49 was taken as reproductiveeage[9]. Oophorectomy,panhysterectomy or biopsy done for clinically suspected ovarian tumours were received at department of pathology, Alluri SitaramaRaju Academy of Medical Sciences ASRAMS, Eluru. Specimens from Department of OBG, ASRAMS and various hospitals in and around Eluru were feeding samples during this period. The samples were fixed in 10% formalin, subjected for grossing according to protocols. Representative bits from pathological areas were taken, processed manually with paraffin embedding. 5µ thin multiple sections were taken and stained with Hematoxylin & Eosin. The sections were studied microscopically in detail and tumors were classified according to WHO classification of ovarian tumors 2003[10]. Special stains were done wherever required

INCLUSION CRITERIA:

Oophorectomy specimens with primary neoplastic lesions. Hysterectomy with unilateral and bilateral salpingooophorectomy specimens with primary and secomdary neoplastic lesions

EXCLUSION CRITERIA:

Ovaries with non neoplastic lesions.

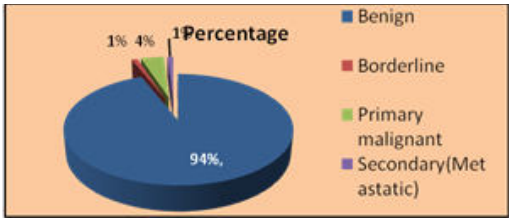
RESULTS

A total of 100 cases of ovarian tumours from patients in reproductive age were analyzed during period between August 2010 and September 2013 in the Department of Pathology, Alluri Sitarama Raju Academy os Medical Sciences (ASRAMS),Eluru. Clinical history, symptoms were recorded. Gross features were noted and histopathological study was carried out with routine H&E and special stains. The cases were studied, analyzed and categorized according to W.H.O. classification. Out of the 100 cases 99 were primary ovarian tumours, 1 was secondary / metastatic tumour (**table 1**). Out if the 99 primary tumours 94 were benign, 1 was borderline tumour and 4 were malignant

tumours (**graph 1**). Most tumours occurred in age between 30-40 years. Benign tumours peaked in 30-40 years of age. Malignant tumours occurred in 15-20 and 40-49 age groups.

Table1: Primary versus Secondary (Metastatic) Ovarian Tumors

Sl no	Tumor type	Number of cases	%
1	Primary ovarian tumors	99	99
2	Secondary ovarian tumors	1	1



Graph 1:showing distribution of benign, borderline and malignant ovarian tumours

Adopting the WHO classification it was found that the number of surface epithelial tumours was maximum, accounting to 85 (85%) cases followed by germ cell tumours 10 (10%) cases and 4 (4%) cases were sex cord stromal tumors in the present study (**table 2**).

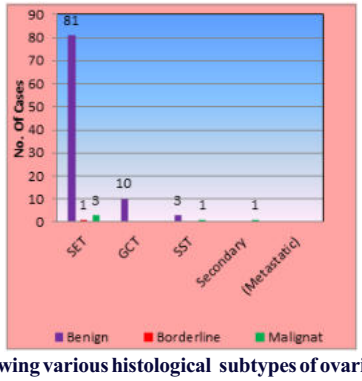
Of the 99 primary tumours 85(90.4%) were surface epithelial tumours, 10 (10.6%) were germ cell tumours and 4 (4.2%) were sex-cord stromal tumours.1metastatic tumour, endometrioid carcinoma from endometrium was noted. 92 (92%) tumours were unilateral, 42 on right side and 46 on left side. 8 (8%) were tumours were bilateral. 6 benign tumours and 2 malignant tumours were showing bilateral involvement. Most of the tumours had a greatest diameter between 11-20 cms. Largest benign tumour was serous cystadenoma measuring 30 cms in diameter and largest malignant tumour was mucinous cystadeno carcinoma measuring 28 cms in diameter. Mass per abdomen and pain in abdomen were the common clinical manifestations. Menstrual irregularity, infertility, urinary symptoms and ascites were other presenting complaints (table 3).

Table2: Histological types of tumours as per WHO classification

Sl no	Type of tumor	Ben	Borderline	Mal	Total	%
1	SET	81	1	3	85	85
2	GCT	10	-	-	10	10
3	SST	03	-	1	04	04
4	Secondary/Metastatic	-	-	1	1	1
5	Total	94	1	5	100	100

Ben–benign, Mal- malignant, SET-surface epithelial tumours, GCT –germ cell tumours, SST-sex cord stromal tumours

Out of the 94 benign tumours, 79 (84%) were cystic, 5(5.3%) were solid and 10 (10.6%) were both solid and cystic in consistency.2 (40%) of the malignant tumours were solid and 3 (60%) were mixed in consistency. Serous cystadenomas was the commonest type of tumour encountered in this study, which comprised of 42% of all ovarian tumours and 49.4% of surface epithelial tumours. Mucinous cystadenocarcinoma was the most common malignant tumour recorded, accounting for 40% of all malignant tumours.



Graph2: showing various histological subtypes of ovarian tumours

Fibroma was the commonest sex-cord stromal tumour in this study comprising 75% of all sex-cord stromal tumours. 10 cases of germ cell tumours were recorded on the present study, all were benign cystic teratoma. The predominant components of the dermoid cyst were skin and adnexal structures and other germ line structures like cartilage, smooth muscle, and fat tissue.

Table3:Clinical presentation of ovarian tumours

Symptoms	No.of BEN tumours	No.of borderline tumours	No.of MAL tumours
Mass P/A	65	1	4
Pain abdomen	59	1	4
Menstrual irregularity	8	-	1
Ascites	-	-	4
Urinary complaints	4	-	-
Infertility	1	-	1

DISCUSSION

The ovary is a frequent site for both primary and metastatic tumors. The complex structure of ovaries makes the neoplasms arising from them to inherit a wide spectrum of histogenesis, clinical behavior, and histological types.

Total number of cases in the present study was 100 of which surface epithelial tumours accounted for 85% of total ovarian tumours; germ cell tumours 10%, sexcord stromal tumours 4% and metastatic tumours accounted for 1%.These findings were almost similar to the study of Couto et.al (**tale 4**)

Table4: Comparision of broad histological types with other studies

Study	SET	GCT	SST	METS
Gupta et al[11] (1971),n=340	54.7%	31.2%	7.1%	6.3%
Pilli et al[12] (2002),n=282	71.0%	21.3%	7.0%	0.7%
Jha et al[13] (2008),n=135	52.2%	42.2%	3.1%	2.5%
Couto et al[14] (1993),n=343	75,6%	20.4%	4.0%	-
Present study n=100	85%	10%	4%	1%

SET- surface epithelial tumours, **GCT**-germcell tumours, SST-sexcord stromal tumours, METS- metastatic

Majority of ovarian tumours occur during reproductive age group In the present study maximum number of (62.7%) of benign tumours were observed between the age group 21-40 years which is period of active reproductive life. Similar findings were observed in studies conducted by Verma and Bhatia and Jha R and Karki S **(table 6).**

Table 5: Comparative analysis of incidence of benign, borderline and malignant ovarian tumours

Study	Benign	Borderline	Malignant
Gupta et al(1986)[11] n=340	59.4%	0.6%	40%
Misra et al(1991)[15]	79.74%	-	22.64%
Couto et al(1993)[14] n=343	80.76%	2.33%	16.91%
Piili et al (2002)[12] n=282	75.2%	2.8%	21.9%
Novak et al (2002)[16] n=130	93.1%	2.3%	4.6%
Jha R& Karki S(2008)[13] n=135	83.9%	-	16.1%
Present study n=100	94%	1%	4%

In our study majority (60%) of malignant ovarian tumours occurred after 40 years. In Jha R& Karki S13,Jagadeeshwari et al17 studies fifth decade was most common age group for malignant tumours. Ramachandran et al18 had equal incidence of malignat tumours acrossthird, fourth and fifth decades (**table 7**).

Surface epithelial tumours account for 50-55% of all ovarian tumours constituting majority of ovarian tumour. In our study surface epithelial tumours were the predominant type (85%) and the peak age of incidence was 31-40 years. Jagadeeshwari et al and Ganga Pilli et al also recorded similar findings their studies (**table 8**).

Table 6:Distribution of benign ovarian tumours in reproductive age group

Study	Age (years)			
	11-20	21-30	31-40	41-50
Jagadeeshwari et al(1971)[17] n=265	16%	36%	32.3%	10.5%
Ramachandran et al(1972)[18]n=903	9.8%	30.7%	22%	20.4%
Verma & Bhatia[19]n=403	10%	38.5%	23.3%	17%

Jha R& Karki (2008)[13]n=135	7.4%(upto 20 years)	22.9%	28.8%	19.2%
Present study n-100	10.6%	20.2%	42.5%	26.5%

(Lower age limit is taken as 11years and upper age limit is taken as 50 years for comparision with other studies)

Benign surface epithelial tumours were the commonest type of surface epithelial tumours (95.2%) followed by malignant surface epithelial tumours (3.52%) and the rest were borderline surface epithelial tumours. In our study the incidence of border line tumours was less in comparison with Tyagi et al and Maheshwari et al.

Table 7: Comparison of distribution of malignant ovarian tumours in reproductive age group

Study	Age9years)			
	11-20	21-30	31-40	41-50
Jagadeeshwari et al[17]n=265	13.9%	16.41%	19.9%	27.8%
Ramachandran et al[18]n=903	10.5%	26.3%	29.5%	21.8%
Verma&Bhatia[19],n=403	9.77%	17.2%	27%	21.8%
Jha R& KarkiS[13]n=135	3.8% (upto 20 years)	7.68%	15.3%	30.7%
Present studyn-100	20%	-	20%	60%

(Lower age limit is taken as 11years and upper age limit is taken as 50 years for comparison with other studies

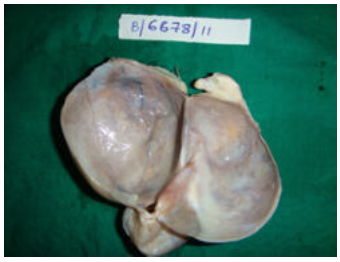
In Asian population serous tumours account for 20-25% of all ovarian tumours. In the present study serous tumours were 46% of all ovarian tumours, which is in accordance with studies of Couto et al, Jha et al and Misra et al. In our study mucinous tumours comprised of 37% of all ovarian tumourswhich was higher when compared to other studies. Gupta et al[11](25%), Prabhakar and Maingi[22] (25%), Couto et al[14](27.6%), Jha R and Karki et al[13](20%).

Table 8: Comparison of incidence and peak age incidence of surface epithelial tumours

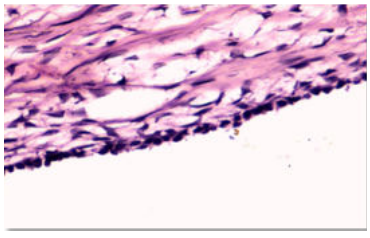
Study	Total no.of cases	No .of SETs	Incidence (%)	Peak age group involved
Tyagi S.P et al[20] n=120	120	74	61.6%	30-40
Gupta S et al[11] n=340	340	186	54.7%	21-40
Jha R et al[13] n=135	161	84	52.2%	31-40
Ganga pilli et al[12] n=282	282	188	70.9%	20-40
Jagadeeshwari et al[17]n=265	265	203	76.6%	21-40
Present study N=100	100	85	85%	31-40

In the present study there were 4 cases (4%) of sex-cord stromal tumours were recorded. Similar results were found in studies by Tyagi et al, Couto et al and Jhaet al. Granulosa cell tumours accounted for 1% of all ovarian tumours which is same as in Couto et al"s study. Granulosa cell tumor nwas seen in young patient who presented with mass per abdomen and menstrual disturbances.

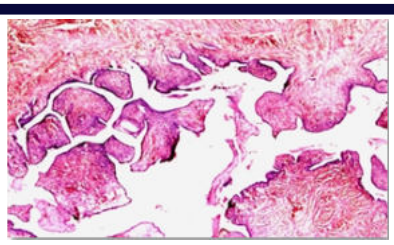
PICTURES



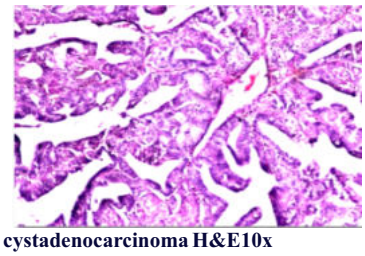
Pic1: Gross serous cystadenoma



Pic 2:Serous cystadenoma H &E 40x

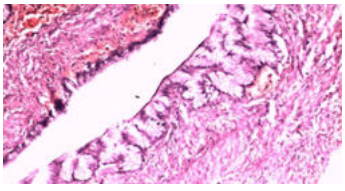


Pic3 serous cystadenofibroma H&E 10x

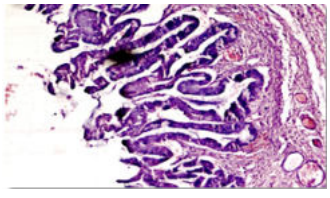


Pic4: serous cystadenocarcinoma H&E10x

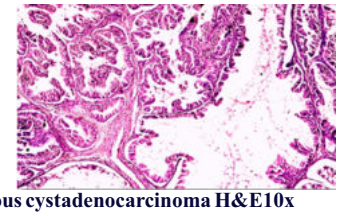
Pic 5:Gross mucinous cystadenoma



Pic6: mucinous cystadenoma H&E 10x

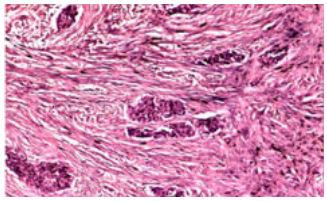


Pic7: borderline mucinous neoplasm H&E10x

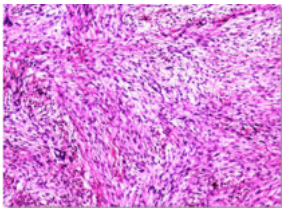


Pic 8: mucinous cystadenocarcinoma H&E10x

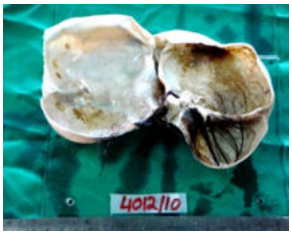
Pic9: Gross Brenner tumor



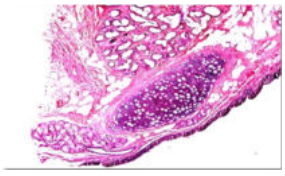
Pic10: Brenner tumor H& E 10



Pic-11 Fibroma H&E 10x



Pic12:Gross Cystic Teratoma



Pic13Cystic Teratoma H&E 10x

CONCLUSION

Studying the macroscopic and microscopic features of ovarian tumours will enable proper categorization into definite morphologic type which will help gynaecologists to plan proper management for the patients in reproductive age group. In the present era of molecular diagnosis, with large emphasis on is being laid genetic studies like PCR, FISH genome wide association studies for various tumours and other diseases, histopathology is still the gold standard in diagnosing most of the ovarian tumours. Other adjuvant techniques like Immuno-Histochemistry(IHC), flowcytometry will be useful resolving problematic, difficult, dilemmatic cases and to predict prognosis.

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