

## A 5 Year Retrospective Study of Histopathological Patterns of Ovarian Tumors

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### ABSTRACT

**Background:** Ovarian tumors represent about 30% of all cancers of the female genital system and show a wide spectrum of histological types and clinical behaviour. Ovarian cancer is the leading cause of mortality of female gynaecological cancers and ranks seventh as the most common cancer worldwide. The increasing life expectancy has led to increase in its burden exponentially now even in developing countries but limited knowledge is there about the pattern of ovarian tumours. The present study was done with the aim of studying the histopathological pattern of the ovarian tumors in women of various age groups.

**Methods:** This was retrospective analysis of all cases of ovarian cancer, and benign ovarian neoplasms received during 5 year period from January 2014 to December 2018 at pathology department of Gandhi Medical College and Hamidia Hospital, Bhopal (M.P). Data regarding age and tumor histology were collected from medical records. Routine H/E staining was performed. Immunohistochemistry (IHC) was done in difficult cases.

**Result:** Of 350 cases 245 (45.2%) were benign, 27 (4.9%) were borderline / uncertain and 78 (14.4%) were malignant tumors. For all age groups, benign tumors were more common than malignant ones. Most ovarian tumors were seen between 21-50 years (272, 77.7%). Surface epithelial tumors were most common (253, 72.2%) followed by germ cell tumors (70, 12.9%).

**Conclusion:** The present study has revealed a spectrum of ovarian tumors over a wide range from adolescent to late reproductive to menopausal and late menopausal age group. Benign tumors are more common than malignant ones.

**Keywords:** Surface Epithelial Tumors ; Ovarian Tumors ; Germ Cell Tumor.

### Introduction

Ovarian cancer is the seventh most common cancer worldwide. In India, too female cancer cases, especially ovarian cancer figures are escalating. India shows dangerous data of having 3rd highest number of cancer cases among women after China and USA. Infact, India has the 2nd highest incidence of ovarian cancer globally.<sup>[1]</sup> Indian cancer registry data project ovary as an important site of cancer in women comprising 8.7% of cancers in various parts of the country.<sup>[2]</sup> About 95% of these tumors have been found to be benign. They are most common during child bearing age of 20 and 45 years whereas malignant tumors are more common in older women between the ages of 45 and 65 years having poor prognosis.<sup>[3]</sup> The overall 5-year survival is 45% primarily because of the late stage at diagnosis of the disease.<sup>[4]</sup> However, the clinical behavior of this malignancy varies widely, from an excellent prognosis and high likelihood of cure to rapid progression and poor prognosis, most probably reflecting variation in the tumor, biological properties. The survival rate of patients with early stage disease approaches 90%, but most cases are diagnosed late when the symptoms such as abdominal distension caused by ascites or large tumor masses become apparent.<sup>[5]</sup>

The present study was conducted with the aim of studying the histopathological pattern of various ovarian neoplastic lesions and their frequency in different age groups.

### Materials and Methods

This was retrospective analysis of all cases of ovarian cancer, and benign ovarian neoplasms received during 5 year period from January 2014 to December 2018 at pathology department of Gandhi Medical College and Hamidia Hospital, Bhopal (M.P). Data regarding age and tumor histology was collected from the archived medical records. Routine H/E staining was performed.

### Statistical Analysis

The data was collected and analyzed using standard statistical chi – square test,  $P < 0.05$  statistically significant. Data was entered in Microsoft excel and analysis was done using SPSS version 22.

### Result

A total of 350 different neoplastic lesions of ovaries were studied during 5 year period from January 2014 to December 2018.

Neoplastic tumors included, benign (245; 70%) borderline / uncertain (27; 7.7%) and malignant (78; 22.2%) cases

**(Table. 1) (fig.1).** The age range of our patients was from 2 months to 85 years. Surface epithelial tumors were most common (253, 72.2%) followed by germ cell tumors (70, 12.9%) **(Table. 2) (fig.2)** . Benign surface epithelial tumors comprised 55.6% (195/350) of all benign tumors includes Serous cystadenoma 145 (41.4%), Serous cystadenofibroma 03 (0.86%), Mucinous cystadenoma 45 (12.8%), Benign brenner tumor 02 (0.57%), whereas their malignant counterpart formed 13.05% (46/350) of all malignant tumors which includes Serous cystadenocarcinoma 30 (8.5%), Mucinous cystadenocarcinoma 12 (3.4%), Endometrioid carcinoma 02 (0.57%), Clear cell carcinoma 01 (0.29%), Malignant brenner tumor 01 (0.29%) . Germ cell tumors includes benign tumors Mature cystic teratoma 45 (12.8%), Struma ovarii 01 (0.29%) and malignant tumors include Dysgerminoma 04 (1.1%), Mature cystic teratoma 03 (0.86%), Yolk sac tumor (endodermal sinus tumor) 06 (1.7%), Mixed germ cell tumors 10 (2.8%), Embryonal cell carcinoma 01 (0.29%). Sex cord stromal tumors

includes Fibroma 04 (1.1%), and Granulosa cell tumor 15 (4.2%) constituting 19 (5.4%) cases of all ovarian tumors. Metastatic tumors 07 (2.01%) of ovaries includes Carcinoid ovary 01 (0.29%), Krukenberg’s tumor 03 (0.86%) and 03 (0.86%) cases of Metastasis to ovary.

For all age groups, benign tumors were more common than malignant ones. Most ovarian tumors were seen between 21 – 50 years (272, 77.7%). **(Table. 2) (fig.2).** Most commonly seen are surface epithelial tumors and accounted for 253 (72.02%) of all ovarian tumors. Among these, serous cytsadenomas showed wide range of age distribution with youngest case of age 2 month and 4 month and oldest case was 85 year old. Germ cell tumors constituted 19.87% of all ovarian tumors and seen mostly upto 50 year of age. Seven Metastatic tumors of ovary were found in age group ranging 21 – 70 years constituting 1.97%. 01 case of undifferentiated tumor is reported in 55 year age of patient. **(Tab no. 3) (fig.3).**

**Table 1: Distribution of tumors of ovary (n = 350).**

Type	Number (%)
Benign	245 (70%)
Borderline /uncertain	27 (7.7%)
Malignant	78 (22.2%)
<b>Total</b>	<b>350 (100)%</b>

**Table 2: Disribution of ovarian tumors in various age group.**

Age grp (in yrs)	Benign (n= 245)	Borderline/uncertain (n= 27)	Malignant (n= 78)	Total (n= 350)
<b>0-10</b>	02 (0.81%)	01(3.7%)	02(2.5%)	05(1.4%)
<b>11-20</b>	17(6.9%)	03(11.1%)	07(8.9%)	27(7.7%)
<b>21-30</b>	76(31.0%)	05(18.5%)	16(20.5%)	97(27.7%)
<b>31-40</b>	62(25.3%)	05(18.5%)	22(28.2%)	89(25.4%)
<b>41-50</b>	62(25.3%)	09(33.3%)	15(19.2%)	86(24.5%)
<b>51-60</b>	23(9.3%)	02(7.4%)	10(12.8%)	35(10%)
<b>61-70</b>	02(0.81%)	02(7.4%)	03(3.8%)	07(2.0%)
<b>71-80</b>	00(0.0%)	00(0.0%)	03(3.8%)	03(0.85%)
<b>81-90</b>	01(0.40%)	00(0.0%)	00(0.0%)	01(0.28%)
<b>Total</b>	<b>245 (100%)</b>	<b>27 (100%)</b>	<b>78 (100%)</b>	<b>350 (100%)</b>

**Table 3: Frequency of different classes of tumors in different age groups.**

Age grp in yrs	Surface epithelial tumors	Germ cell tumor	Sex cord stromal tumor	Metastatic tumor	Undifferentiated tumor	Total
0-10	02(0.57%)	02(0.57%)	01(0.28%)	00(0.0%)	00(0.0%)	05(1.42%)
11-20	13(3.7%)	13(3.7%)	02(0.57%)	00(0.0%)	00(0.0%)	28(8.0%)
21-30	67(19.1%)	25(7.1%)	01(0.28%)	01(0.28%)	00(0.0%)	94(26.8%)
31-40	66(18.8%)	18(5.1%)	06(1.7%)	01(0.28%)	00(0.0%)	91(26.0%)

Age grp in yrs	Surface epithelial tumors	Germ cell tumor	Sex cord stromal tumor	Metastatic tumor	Undifferentiated tumor	Total
41-50	66(18.8%)	12(3.4%)	07(2.0%)	03(0.85%)	00(0.0%)	88(25.1%)
51-60	31(8.8%)	00(0.0%)	01(0.28%)	01(0.28%)	01(0.28%)	34(9.7%)
61-70	05(1.4%)	00(0.0%)	01(0.28%)	01(0.28%)	00(0.0%)	07(2.0%)
71-80	02(0.57%)	00(0.0%)	00(0.0%)	00(0.0%)	00(0.0%)	02(0.57%)
81-90	01(0.28%)	00(0.0%)	00(0.0%)	00(0.0%)	00(0.0%)	01(0.28%)
<b>Total</b>	<b>253(72.02%)</b>	<b>70(19.87%)</b>	<b>19(5.39%)</b>	<b>07(1.97%)</b>	<b>01(0.28%)</b>	<b>350(100%)</b>

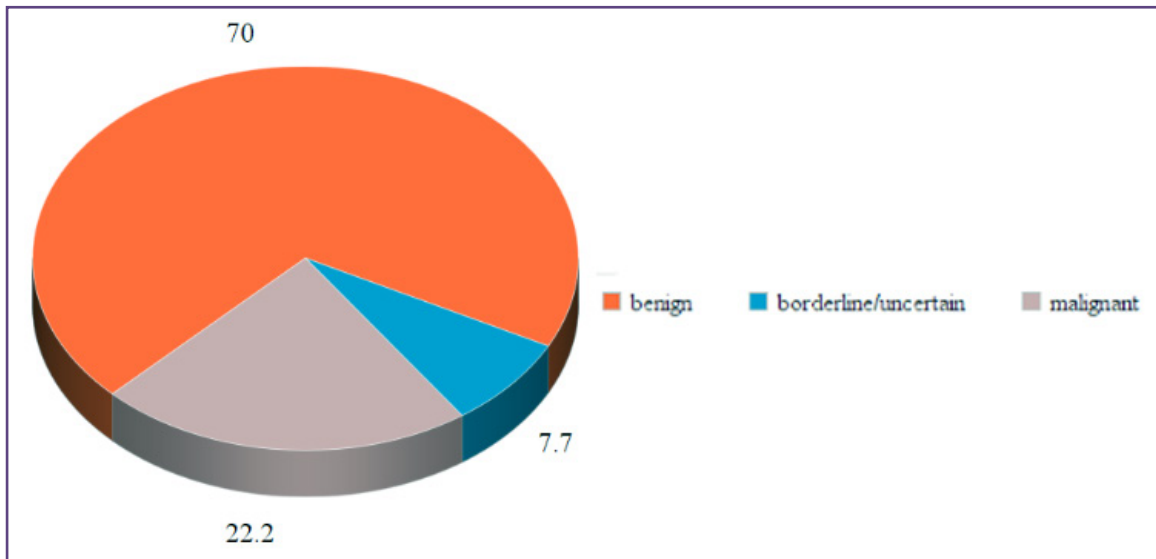


Fig. 1: Distribution of tumors of ovary (n = 350).

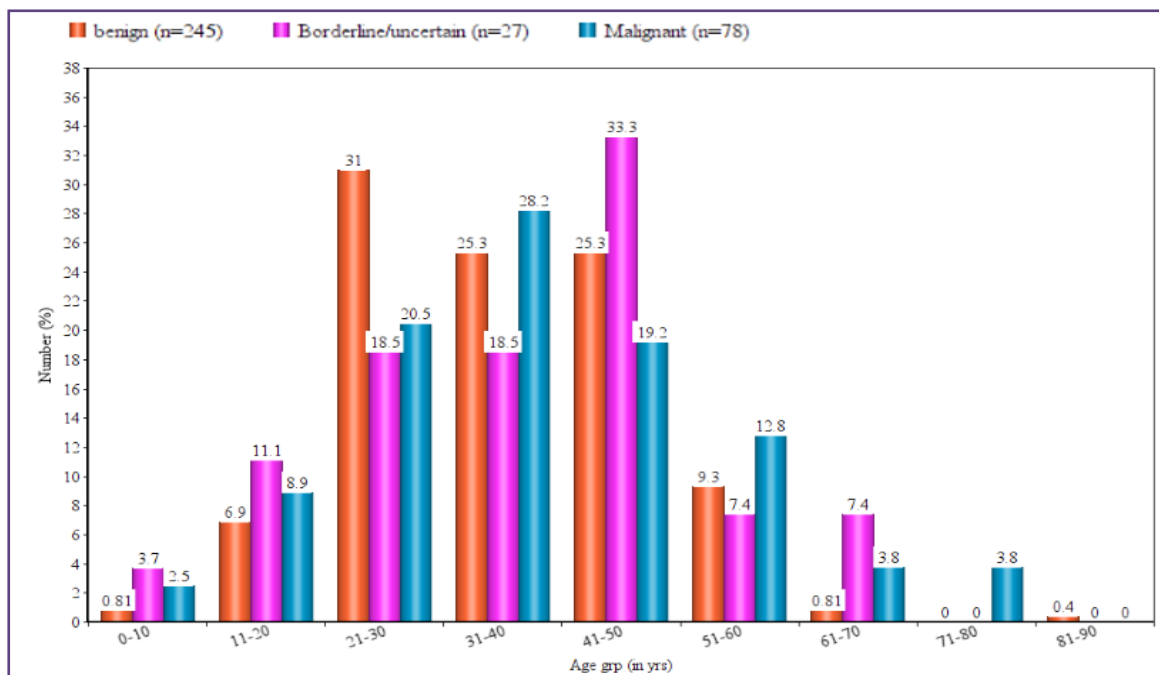


Fig. 2: Distribution of ovarian tumors in various age group

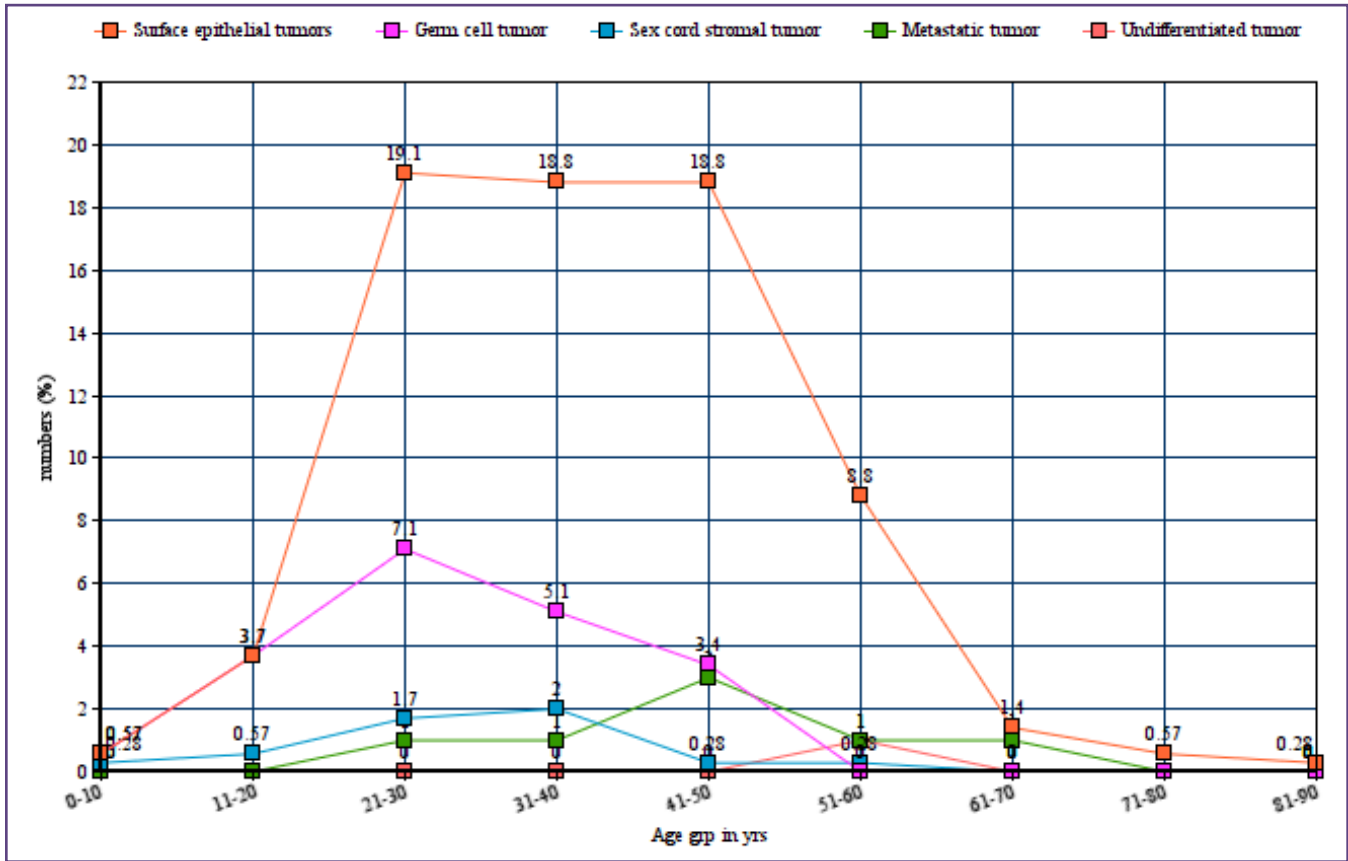


Fig. 3: Frequency of different classes of tumors in different age groups.

**Discussion**

Main aspects considered in this study were histopathological types and frequency of different histopathological types of ovarian tumors and tumor like lesions in different age groups. In present study, total 350 cases of ovarian tumors were studied. There were 245 benign (70%), 27 borderline / uncertain (7.7%) and 78 malignant (22.2%) cases. Similar observations were made by Mankar and Jain<sup>[6]</sup> and Sanjeev et al.<sup>[7]</sup>

Ovarian tumors are classified according to WHO classification. Among the different histopathological patterns, Benign serous tumors including serous cysts were the commonest benign tumor constituting 39.7% followed by mature teratoma and mucinous cysts each constituting 12.9%. Studies done by Garg et al.,<sup>[8]</sup> Patil et al.,<sup>[9]</sup> and Modepalli and Venugopal<sup>[10]</sup> had similar findings. However, in Mankar and Jain<sup>[6]</sup> mucinous cystadenoma (32.69%) was the most common tumor.

In this study germ cell tumors accounted the second most common tumor 19.87% of all ovarian tumors, similar to the findings of many other studies Sawant A et al.,<sup>[11]</sup> and Singh S et al.<sup>[3]</sup>

Among 70 cases of germ cell tumors, mature teratoma was the commonest about 12.9% of all ovarian tumors which is equal to mucinous cystadenoma (12.9%).

Among malignant tumors, mature cystic teratoma comprising 0.86%, and other 1.1% of dysgerminoms and 1.6% of yolk sac tumor was reported as malignant germ cell tumor. This result correlated with studies by Thakkar N, et al.,<sup>[12]</sup> and Prakash A, et al.<sup>[13]</sup>

Sex cord stromal tumors comprises of only 5.4% of total ovarian tumors, of which 1.1% of fibroma and 4.2% of granulosa cell tumor. The incidence was very close to the finding of Thakkar N, et al.<sup>[12]</sup>

Overall ovarian tumors found in the age range of 2 month to 85 years, in our study which is similar to the studies conducted by Garg et al.,<sup>[8]</sup> Mankar and Jain,<sup>[6]</sup> and Modepalli and Venugopal.<sup>[10]</sup> However, in Sanjeev et al.,<sup>[7]</sup> the lowest age for ovarian tumors was 2 years. In our study, the lowest age for ovarian tumor was 2 months in one case of simple serous cystadenoma. Maximum age of ovarian tumors was 85 years in our study which corroborated well with the studies done by Patil et al.,<sup>[9]</sup> And Sanjeev et al.<sup>[7]</sup>

Maximum number of cases 27.7% were in the age range of 21 – 30 years. Similar observations were made by Mankar and Jain.<sup>[6]</sup>

Most of the benign neoplasms were seen in 3<sup>rd</sup> and 4<sup>th</sup> decade with mean age of 30.7 years.

Malignant neoplasms were expectedly seen with advancing age peaking in 4<sup>th</sup> decade of life with mean age of presentation being 37.5 years.

Mankar and Jain.<sup>[6]</sup> and Garg et al.,<sup>[8]</sup> reported 96% epithelial tumors in her series. In our study 72.2% epithelial tumors were diagnosed with 46 cases of malignant epithelial tumors accounting for 13.1% of all malignant neoplasms. The serous cystadenocarcinoma was the most common tumor in the present study (30, 8.5%). Also 12 (3.4%) cases of mucinous cystadenocarcinoma are reported in present study. Similar observations were made in study by olivia et al.<sup>[14]</sup>

### Conclusion

The present study has revealed a spectrum of ovarian tumors over a wide range from adolescent to late reproductive to menopausal and late menopausal age group. Benign tumors are more common than malignant ones.

Of 350 cases 245 (45.2%) were benign, 27 (4.9%) were borderline / uncertain and 78 (14.4%) were malignant tumors. For all age groups, benign tumors were more common than malignant ones. Most ovarian tumors were seen between 21-50 years (272, 77.7%). Surface epithelial tumors were most common (253, 72.2%) followed by germ cell tumors (70, 12.9%).

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### Competing Interests

None

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