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ORIGINAL ARTICLE

PATTERN OF OVARIAN TUMORS AND THEIR AGE DISTRIBUTION IN KANGRA VALLEY, HIMACHAL PRADESH

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ABSTRACT: A female's risk at birth of having ovarian tumors in her lifetime is 6-7%. Relative frequency of ovarian tumor is different for western and Asian countries. Two third of ovarian tumors occur in women of reproductive age group. This study is done in Dr. RPGMC and Hospital with the aim to find out frequency of different histological types of ovarian tumors and their age distribution in Kangra valley. One hundred forty eight ovarian tumors, reported were included in this study. One hundred sixteen cases (78.4%) are benign, twenty eight (18.9%) are malignant & four (2.7%) are borderline ovarian tumors. Histologically surface epithelial tumors were the commonest (77.7%) followed by germ cell Tumors (15.5%), sex cord stromal tumors (6.1%) and metastatic tumors (2.0%). Serous cyst adenoma is commonest benign tumor (50.9%) and serous cystadenocarcinoma are the commonest malignant tumors (42.9%) of all age groups. Benign tumors were more common than malignant ones. Most ovarian tumors (69.6%) were seen between the age of 20-49 years whereas most malignant tumors (71.4%) were seen above the age of 40 years. In 3rd, 4th, 5th decades, Surface epithelial Tumors were more common (74.8%) than other tumors. There is no study in this field in Himachal area, which reflects various ovarian tumour's frequency and also their relationship with the age of the patient. Our study gave a broad view about ovarian neoplasm which is helpful for clinician to do early diagnosis and early treatment.

KEYWORDS: Ovarian tumour, Salpingo-oophorectomy.

INTRODUCTION: Worldwide, ovarian cancer is the sixth most common cancer in women. In most western countries, ovarian carcinoma is the fifth most common malignancy and ranks fourth in cancer mortality. In the western hemisphere, it accounts for 4% of cancer in women and is the most frequent cause of death from gynaecologic cancer. In U.S. women, ovarian cancer accounts for 5% of cancer deaths. Approximately 1.4% of American women will develop ovarian cancer in their lifetime. Annual incidence rates of ovarian cancer range from less than 5 per 100,000 women in Gambia, Brazil, Thailand, Algeria, and India, to greater than 13 per 100,000 in the UK, United States, Germany, Norway, Denmark and Sweden.

Relative frequency of different ovarian tumor is different for western world and Asian countries, for example, surface epithelial tumors account for 50.0 – 55.00% of all ovarian tumors and their malignant counterpart for approximately 90.0% of all ovarian cancers in the western world. Whereas this figure is 46.-50.0% and 70-75% respectively in Japan. Similarly mucinous tumors account for 12–15% of all ovarian tumors in western world. This figure is 20-23% for Japan. Germ Cell tumors account for 30% of primary ovarian tumors and malignant germ cell tumors account for 3% of all ovarian cancer in western world. About two third of ovarian tumors occur in women of reproductive age group. Fewer than 5% are found in children. 75 to 80% ovarian tumors are benign, 55-65% of benign tumors occur in females under 39 years. Benign serous tumors can occur at any age but are more common in reproductive age group.

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Serous adenocarcinomas are extremely rare in first two decade of life. Mucinous Cystadenoma may occur at any age but are most often diagnosed in 4th–6th decade. Mucinous cancer has been age of 53–54 years. In patients under the age of 21, approximately 60.0% ovarian tumors are germ cell tumors, accounting for two third of ovarian cancer in 1st two decade of life.[1] This study is conducted with the aim to find out frequency of different histological type of ovarian tumors reported from department of pathology of Dr. RPGMC and hospital to analyse age distribution of these tumors.

MATERIAL AND METHODS: This is a retrospective and prospective study with histopathologically proven ovarian tumors, reported from department of pathology of Dr. RPGMC Tanda at Kangra (H. P.) These cases included those patients who were operated at Dr. Rajendra Prasad Government Medical College & Hospital and specimens were processed in department of pathology of Dr. RPGMC. All cystectomy, oopharectomy, Salpingo oophorectomy & total abdominal hysterectomy with bilateral or unilateral salipingo-oopphorectomy specimens were included. However 3 ovarian tumors were excluded from the study because proper details were not available. World Health Organization classification of ovarian tumors[2] was used for classifying the tumors.

RESULTS: Specimens of 151 cases with ovarian tumors were processed in Dr. RPGMC, Kangra, Histopathology laboratory. Three patients had inadequate details so they were excluded. Out of 148 ovarian tumors included, 78.4% (116/148) were benign, 18.9% (28/148) malignant and 2.7% (4/148) was borderline. Surface epithelial tumors were most common 77.7%, followed by germ cell tumors (15.5%), Sex cord stromal tumors (6.1%), metastatic (0.7%). Benign surface epithelial tumors comprised 78.4% (91/116) of all benign tumors, where as their Malignant counterpart formed 71.4% (20/28) of all malignant tumors. Borderline Surface epithelial tumors are 100% of all borderline tumors. Sixty seven Ovarian tumors 45.3% (67/148) were found in 20-39 years age group. For all age groups, benign tumors were more common than malignant ones. Seventy four ovarian tumors were found up to 39 years of age in which 87.8% (65/74) were benign.

Whereas only 68.9% (51/74) of all tumors occurring above 39 years were benign. Malignant tumors were far less common below 39 years. Of all malignant tumors, 71.4% (20/28) were seen above the age of 39 years where as this was 28.5% (8/28) up to 39 years. Four tumors belonging to borderline category were seen, out of it only 25% (1/4) was below 39 years of age and 75% (3/4) were above the age of 39 years. Seventy three serous surface epithelial tumors were seen and accounted for 49.3% (73/148) of all ovarian Tumors. In which 61 out of 73(83.6) were benign whereas 12 out of 73 (16.4) were malignant. Mucinous surface epithelial Tumors in this study accounted for 20.3% (30/148) of ovarian tumors.

Out of these 73.3 % (22/30) were benign, 16.7% (5/30) were malignant and 10% (3/30) were borderline. Seromucinous tumors in this study accounted for 4.1% (6/148). Out of these, 83.3% (5/6) were benign & 16.7% (1/6) were border line. Of all ovarian tumours only 2.0% (3/148) were Brenner's tumors which were benign. Of all malignant tumors 7.1% (2/148) were endometrioid carcinoma and 3.6% (1/148) clear cell carcinoma. Germ Cell Tumors constituted 15.5% (23/148) of all ovarian tumors in which 82.6% (19/23) were benign and all of these benign germ cell Tumors were mature cystic teratoma. Benign Germ Cell Tumors constituted 16.4% (19/116) of all benign ovarian tumors. Whereas malignant germ cell tumors constituted 14.3% (4/28) of all malignant ovarian tumor.

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Overall serous cystadenoma was the most common tumor and constitute 39.9% (59/148), of all ovarian tumors & 50.9% (59/116) of all benign tumors. Benign serous tumors were found between the ages of 19-80 years. Out of these 85.2% (52/61) were between 20 – 49 years of age. Serous cystadenomas were not seen below 29 years of age. Most serous carcinomas, 91.7% (11/12) were found between the age group of 40-69 years.

Benign mucinous tumors were found from 20-79 years of age but 77.3% (17/22) were between 20-59 years of age. Benign Germ Cell Tumors were seen up to the age of 69 years. However most of them, 79% (15/19) were seen in the age group of 20-39 years of age. Malignant Germ cell Tumors were seen only in the age group of 19 -29 years constituting to 66.7% (4/6) of all malignant ovarian tumors up to the age of 29 years. Sex cord stromal Tumors comprised only 6.1% (9/148) of all ovarian tumors. Metastatic tumors of ovary were far less common 0.7% (1/148) than primary ovarian tumors.

CLASSES OF TUMOR	BENIGN	MALIGNENT	BORDER LINE	TOTAL
Tumor of Surface epithelium	91	20	4	115 (77.7%)
Germ cell tumor	19	4	0	23 (15.5%)
Sex cord stromal tumor	6	3	0	9 (6.1%)
Metastatic tumor	0	1	0	1 (0.7%)
TOTAL	**116 (78.4%)**	**28 (16.9%)**	**4 (2.7%)**	**148 (100%)**

Table 1: Frequency of different Classes of Benige Malignant of Tumour (148)

AGE GROUP	TUMOR OF SURFACE EPITHELIUM	GERM CELL TUMOR	SEX CORD STROMAL TUMOR	METASTATIC TUMOR	TOTAL
>19	3	3	1	-	7 (4.7%)
20-29	21	8	1		30 (20.3%)
30-39	26	9	1	1	37 (25%)
40-49	30	1	5		36 (24.3%)
50-59	16	1	1		18 (12.2%)
60-69	14	1	0		15 (10.1%)
70-79	4	0	0		4 (2.7%)
≥ 80	1	0	0		1 (0.7%)
TOTAL	115 (77.7%)	23 (15.5%)	9 (6.1%)		148 (100%)

Table 2: Frequency of different Classes of Tumours in different Age Groups

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DIAGNOSIS	<19	20-29	30-39	40-49	50-59	60-69	70-79	≥ 80	TOTAL
Serous cystadenoma	1	16	17	19	2	2	1	1	59 (50.9%)
Serous cystadeno fibroma	0	0	1	0	0	1	0	0	2 (1.7%)
Mucinous cystadenoma	0	3	5	3	5	1	2	0	19 (16.4%)
Mucinous cystadenofibroma	0	0	1	0	0	2	0	0	3 (2.6%)
Seromucinous cystadenoma	1	0	1	1	1	1	0	0	5 (4.3%)
Brenners tumor	0	0	0	0	0	2	1	0	3 (2.6%)
Mature cystic teratoma	1	6	9	1	1	1	0	0	19 (16.4%)
Mature cystic teratoma	1	6	9	1	1	1	0	0	19 (16.4%)
Thecoma	0	0	0	1	0	0	0	0	1 (0.9%)
Fibroma	1	0	1	0	0	0	0	0	2 (1.7%)
Thecofibroma	0	1	0	1	0	0	0	0	2 (1.7%)
Sertoli Leydig cell tumor	0	0	0	1	0	0	0	0	1 (0.9%)
TOTAL	**4**	**26**	**35**	**27**	**9**	**1**	**4**	**1**	**116 (100%)**

Table 3: Frequency of Individual Benign Tumours in different Age Group in Year

DIAGNOSIS	≥ 19	20-29	30-39	40-49	50-59	60-69	70-79	≥ 80	TOTAL
Serous cystadeno carcinoma	0	0	1	3	5	3	0	0	12 (42.9%)
Mucinous cystadeno carcinoma	0	2	0	1	2	0	0	0	5 (17.9%)
Endometrioid carcinoma	0	0	0	1	0	1	0	0	2 (7.14%)
Clear cell carcinoma	0	0	0	0	1	0	0	0	1 (3.6%)
Immature teratoma	1	0	0	0	0	0	0	0	1 (3.6%)
Yolk sac tumour	0	2	0	0	0	0	0	0	2 (7.14%)
Dysgerminoma	1	0	0	0	0	0	0	0	1 (3.6%)
Adult granulosa cells tumour	0	0	0	2	1	0	0	0	3 (10.7%)
Metastatic tumour	0	0	1	0	0	0	0	0	1 (3.6%)
TOTAL	**2**	**4**	**2**	**7**	**9**	**4**	**0**	**0**	**28 (100%)**

Table 4: Frequency of Individual Malignant Tumors in different Age Groups

DIAGNOSIS	≥ 19	20-29	30-39	40-49	50-59	60-69	70-79	≥ 80	TOTAL
Borderline mucinous tumour	1	0	0	2	0	0	0	0	3 (75%)
Borderline seromucinous tumour	0	0	0	0	0	1	0	0	1 (25%)
TOTAL	**1**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**4 (100%)**

Table 5: Frequency of Individual Borderline Tumour in different Age Group

DISCUSSION: In this study 78.4% ovarian tumors were benign, 18.9% were malignant 2.7% were borderline. This is similar to the data from western countries where 75-80% of ovarian tumors are benign[1.] Also study carried in India by pilli et al[2] had approximately similar results that showed 75.2% ovarian tumors were benign, however this figure was only 59.2% in study carried in Pakistan

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by Ahmad et al. Surface epithelial tumors account for 50-55% of all ovarian tumors and their malignant forms for approximately 90.0% of all ovarian cancer in western world. Corresponding figure for Japan is 46-50% & 70-75% respectively.[1] In this study Surface Epithelial Tumors comprised 77.7% of all ovarian tumors. This was different from results of similar study from Pakistan,[3] where surface epithelial tumors comprised 63.5% of all ovarian tumors. Malignant Surface Epithelial Tumors constituted only 71.4%of all ovarian malignancy in this study which resembled from the westerned world data. In west, serous tumors account for about 30% of all ovarian neoplasm, 60.0% of these are benign, 10% are borderline and 30% are malignant. Similarly mucinous tumors account for 12-15% all ovarian tumors in west.

Approximately 75% mucinous tumors are benign, 10%are borderline & 15% are malignant.[1] In this study serous tumors constituted 49.3%of all ovarian tumors. This figure was 42.9% & 32.7%in other studies.[2,4] Mucinous Tumors here comprised 20.3% of all ovarian tumors whereas this figure was 25.5% & 25 % in other studies.[2,4] In this study, 83.6% serous tumors were benign & 16.4% were malignant. Borderline serous tumors were not seen. Similarly 73.3% mucinous tumors were benign, 16.7% were malignant and 10% were borderline. Out of all Seromucinous Tumors 83.3% were benign and 16.7% were borderline. Malignant seromucinous tumors were not seen. Of all ovarian tumors, Brenner's tumors comprised only 2%. Like other studies[3,5,6] serous carcinoma was the commonest malignant tumor in this study. Ethnic difference among ovarian tumors has also been noted. In study of Thaniskasalam et al.[7] in Malaysia, teratoma was the commonest benign tumor among malays & Chinese whereas serous cystadenoma was the commonest among Indians. In this Study Germ Cell Tumors comprised 15.5% of all ovarian Tumors.

This was different to the findings of Sah et al[8] and Kooning et al.[5] who found Germ Cell Tumors to Comprised 43.4% and 44% of all ovarian neoplasm respectively. In western world 95% of ovarian Germ cell Tumors are mature cystic teratoma and only 3% of ovarian teratomas are immature.[1,9] Where as in this study most germ cell tumors were benign (82.6%), and all of these were mature cystic teratoma. 3.6% were malignant Germ Cell Tumors of all ovarian malignancy. Sex cord stromal tumors account for 8% of all primary ovarian tumors.[1] Here they comprised 6.1% of all ovarian Tumors. In present study metastatic ovarian Tumors comprised only 0.7% of all ovarian tumors. So in our study, some data approximated to data from the western world where as these were different from study of Pakistan. Even results of two study from India were different.[2,4] This difference may be due to large population base study in western world and small sample size in Pakistan as well as in our study. Similar to this study, other studies also show that most ovarian tumors occur in women of Reproductive age group. Peak incidence of ovarian Tumor is between 20-39 years of age.[2,10] Benign ovarian Tumors occur in all age group.

Whereas malignant ovarian Tumors are more common in elderly.[10, 11] Majority of benign serous tumors occur in 2nd to 4th decade although they may occur in patient younger than 20 or older than 80 years[9].Serous carcinoma are extremely rare in first two decade of life. Commonest age of serous carcinoma is 50-59 years of age. Mucinous cyst adenoma may occur at any age but are most commonly diagnosed after 3rd to 5th decade. Malignant germ cell tumors are most common ovarian cancers among children & adolescent females[9]. In patients under age of 21, approximately 60% ovarian tumors are germ cell tumors, accounting for two third of ovarian cancer in first two decades of life[1]. Mature cystic teratomas account for half of ovarian neoplasms that appear in first two decade of life. Over 80% mature cystic teratomas occur during the reproductive period. Immature teratomas from 10 to 20% of ovarian cancers occurring first two decades of life.[1] In study of Hassan et al.[12]

In first two decades, 49.1% tumors were germ call tumors and of all malignancies, Malignant germ cell Tumors comprised 44.5%.In this study, under 21 years of age seven ovarian tumors were seen, out of which 43% (3/7) were germ cell Tumors. Mature cystic teratoma accounted for 21.6% (16/74) of all ovarian neoplasm in first three decade and 20.1% were seen from 20-39 years age. Malignant germ cell Tumors here comprised 100 % of all malignancy in first two decades.

Thus we conclude that benign tumors were more common than malignant ones of all age groups. Surface epithelial tumors are most common Class of tumors. Benign Surface epithelial tumors being most common benign tumors and malignant surface epithelial tumors being most common. Malignant ovarian tumors are more common in more than39 years. Germ cell tumors are seen in all age group and are most common tumors up to 39 years. However this study is institution based and has small sample size so the result obtained may or may not reflect the actual histological pattern and age distribution of ovarian Tumors in Indians.so more studies with larger sample size should be done.

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