

A HISTOLOGICAL STUDY OF OVARIAN TUMORS IN DIFFERENT AGE GROUPS

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ABSTRACT

Background: Tumours are the most common type of lesion encountered in the ovary. With exception of these neoplasms, the ovary appears remarkably resistant to disease. There are numerous types of ovarian tumours, both benign and malignant. About 80% are benign and these occur mostly in younger women between the ages 20 and 45 years. The malignant tumours are more common in age groups between 40 and 65.

Aims & Objective: To study the histopathology of ovarian tumors in different age groups.

Materials and Methods: This retrospective study included all consecutive cases with histopathologically proven ovarian tumors, reported from Department of Pathology of N.H.L Municipal Medical College. These included those patients who were operated at V.S Hospital or were operated somewhere else but the specimen was processed in Department of Pathology of N.H.L Municipal Medical College, irrespective of the surgical procedure by which tumor was removed. World Health Organization classification of ovarian tumors was used for classifying the tumors. Hematoxylin and eosin is the routine method for histological study. Hematoxylin is used to define the nucleus by its blue-black colour and its finer details. Commonly used Eosin is Eosin 'Y'.

Results: Out of 100 ovarian tumors included, 73% were benign and 27% were malignant. Surface epithelial tumors were most common (59%), followed by germ cell tumors (14%). Benign surface epithelial tumors comprised 80% (59/73) of all benign tumors whereas their malignant counterpart formed 70.37% (19/27) of all malignant tumors.

Conclusion: Benign tumors are more common than malignant ones for all age groups. Surface epithelial tumors are most common class of tumors in both benign and malignant tumours. Serous cystadenoma is the most common ovarian tumor overall as well as most common benign tumor whereas serous cystadenocarcinoma is most common malignancy. Malignant ovarian tumors are more common above 40 years.

Key Words: Ovary; Tumor; Benign; Malignant; Histopathology

Introduction

Knowledge about the ovary dates from the time of Hemophilus but the real term 'Ovary' was introduced early in the seventeenth century. Ovarian neoplasms have been reported in ancient literature, Shushruta in his book 'Shushruta and Ayurveda' has described ovarian neoplasms. Tumours are the most common type of lesion encountered in the ovary. Ovarian cancer is the 6th most common cancer in females in United States of America. A female's risk at birth of having ovarian tumour sometime in her life is 6.0% - 7.0%, of having ovarian cancer is almost 1.5% and dying from ovarian cancer is 1.0%.^[1] With exception of these neoplasms, the ovary appears remarkably resistant to disease. Intrinsic inflammations of ovary are uncommon, and usually periovarian inflammations are secondary to involvement of adjacent tube. There are numerous types of ovarian tumours, both benign and malignant. About 80% are benign and these occur mostly in younger women between the ages 20 and 45 years. The malignant tumours are more common in age groups between 40 and 65. Ovarian neoplasms are one of

the commonest neoplasms in females. Their classification is difficult because complex structure of ovary. The variation in structure of tumour further complicates the work of classification. A variety of clinical classifications of ovarian tumours have been suggested by the clinician, therapist and pathologist. Serous cystadenomas were the commonest tumour among the cystomas of ovary. Cystomas were common during reproductive life.

Materials and Methods

This retrospective study included all consecutive cases with histopathologically proven ovarian tumors, reported from Department of Pathology of Smt. NHL Municipal Medical College, over two years period from October 2010 to November 2012. These included those patients who were operated at V.S Hospital or were operated somewhere else but the specimen was processed in Department of Pathology of Smt. NHL Municipal Medical College, irrespective of the surgical procedure by which tumor was removed. So all cystectomy, oophorectomy, salpingoophorectomy and total abdominal hysterectomy

with bilateral or unilateral salpingo-oophorectomy specimens were included. However, patients with two different synchronous ovarian tumors were excluded from the study. World Health Organization classification of ovarian tumors^[2] was used for classifying the tumors. All the required data were retrieved from the records of Department of Pathology, NHL Municipal Medical College.

Hematoxylin and eosin is the routine method for histological study. Hematoxylin is used to define the nucleus by its blue-black colour and its finer details. Commonly used Eosin is Eosin 'Y'. It is used to distinguish between cytoplasm of different type of cells. In this method the nuclei of cells is stained by the haematoxylin whilst the cytoplasm is coloured by the eosin. This technique in various forms has been around for over one hundred years designed to show basophilic structures blue, black, purple or grey and acidophilic structures in shades of pink and red. The stain haematoxylin is not a dye, but develops colouring properties on oxidation to haematin. This substance haematin has little or no affinity for tissue elements and requires an inorganic ion to act as a "go between" (called a mordant) between the dye and the tissue. The mordant may be incorporated into the haematoxylin dye bath, the most common method. Or one may pre-treat the tissue with the metal salt and then stain by the haematoxylin. Eosin is an acid dye, which requires an acidic environment to work. In solution the dye molecule is negatively charged and thus attaches to positive site in the tissue by salt bridges.

Results

Out of 100 ovarian tumors included, 73% were benign and 27% were malignant. Surface epithelial tumors were most common (59%), followed by germ cell tumors (14%). Benign surface epithelial tumors comprised 80% (59/73) of all benign tumors whereas their malignant counterpart formed 70.37% (19/27) of all malignant tumors (Table-1).

Fifty ovarian tumors were found in 21-40 years age group. For all age groups, benign tumors were more common than malignant ones. Fifty seven tumors were found up to 40 years of age. Out of these, 86% (43/50) were benign whereas only 72.09% (31/43) of all tumors occurring above 40 years was benign. Malignant tumors were far less common below 40 years. Of all malignant tumors, 74.07% (20/27) were seen above 40 years where as this was 25.9% (7/27) up to 40 years. Tumors belonging to borderline category were not seen during the study period. Benign tumors were more common than malignant tumors. Surface epithelial tumors were the commonest.

Above 30 years, 62 tumors were found. Out of these 42 (67.74%) were surface epithelial tumors and were most common tumors occurring above 30 years. Up to 30 years 28 tumors were found, of this only 10 (35.7%) were surface epithelial tumors. In 1st three decades 60.7% tumors were germ cell tumors (Table-2).

Most ovarian tumors were seen between 21-50 years. Seventy eight serous surface epithelial tumors were seen and most serous tumors (64%) were benign whereas 24.3% were malignant. Mucinous surface epithelial tumors accounted for 30% of ovarian tumors. Out of these, 80% were benign and 20% were malignant. Germ cell tumors constituted 14.1% of all ovarian tumors. Most germ cell tumors (78.5%) were benign and all of these benign germ cell tumors were mature cystic teratoma. Benign germ cell tumors constituted 15.1% of all benign ovarian tumors whereas malignant germ cell tumors constituted 11.1% of all malignant ovarian tumors (Table-3).

Table-1: Frequency of different classes of benign and malignant ovarian tumors (n=100)

Classes of tumors	Benign (%)	Malignant (%)	Total (%)
Surface epithelial tumor	59	19	78
Germ Cell tumor	11	3	14
Sex cord stromal tumor	3	2	5
Metastatic tumor	0	3	3
Total	73	27	100

Table-2: Frequency of different classes of tumors in different age groups (n=100)

Age Group (Years)	Surface Epithelial Tumour	Germ Cell Tumour	Sex Cord Stromal Tumor	Metastatic Tumor	Total
Up to 20	2	4	1	0	7
21-30	8	13	0	0	21
31-40	15	12	2	0	29
41-50	13	7	0	1	21
51-60	8	3	0	1	12
>60	6	2	1	1	10
Total	52	41	4	3	100

Table-3: Frequency of individual benign tumors in different age groups (n=100)

Diagnosis	Up to 20	21-30	31-40	41-50	51-60	>60	Total
Serous cystadenoma	4	12	9	6	3	1	35
Mucinous cystadenoma	2	3	5	6	6	2	24
Mature cystic teratoma	0	3	3	2	1	1	10
Thecoma	1	0	0	0	0	1	2
Serous Cystadenofibroma	0	0	1	0	0	0	1
Fibroma	0	0	0	0	0	1	1
Total	7	18	18	14	10	6	73

Table-4: Frequency of individual malignant tumors in different age groups (n=100)

Diagnosis	Up to 20	21-30	31-40	41-50	51-60	>60	Total
Serous cystadenocarcinoma	0	0	2	3	4	3	12
Mucinous cystadenocarcinoma	0	0	1	3	0	2	6
Metastatic adeno/krukenberg tumor	0	0	0	2	1	2	5
Immature teratoma	1	1	0	0	0	0	2
Granulosa cell tumour	0	0	1	0	0	0	1
Yolk sac tumour	0	1	0	0	0	0	1
Total	1	2	4	8	5	7	27

Overall surface epithelial tumour was the most common tumor. Surface epithelial tumour accounted for 78% of all ovarian tumors, 89% of all benign ovarian tumors. However, among the malignant tumors, serous adenocarcinoma was most common and constituted 44.4% (12/27) of all ovarian malignancy. Benign serous tumors were found from 15-65 years of life. Twelve were serous cystadenomas and one was serous cystadenofibroma of all ovarian malignant tumours. Serous carcinomas were not seen up to 30 years. Most serous carcinomas (83.3%) were seen above 40 years (Table-4).

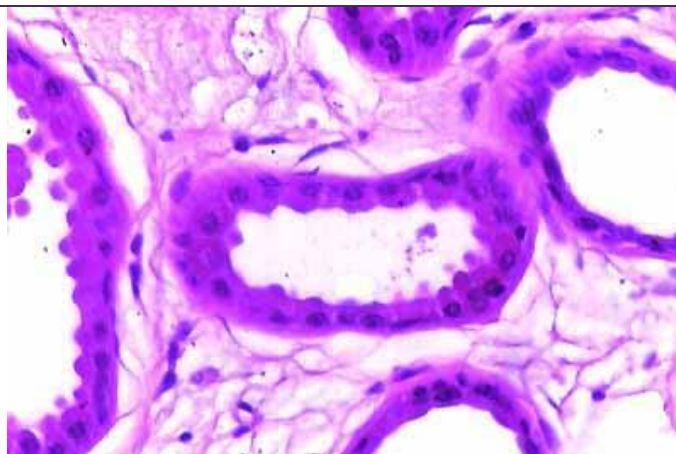


Figure-1: Teratoma

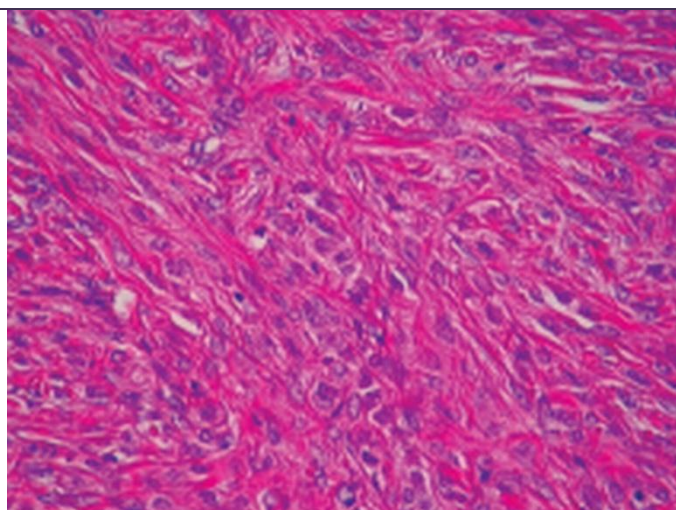


Figure-2: Thecoma

Discussion

In this study, 73% ovarian tumors were benign and 27% were malignant, a total of one hundred ovarian neoplasms were received during a period of two years. This is similar to the data from Scully RE, et al.^[1] where 75.0-80.0% of ovarian tumors are benign. Also study carried in India by Pilli, et al.^[3] had approximately similar results which showed that 75.2% ovarian tumors were benign, however this figure was only 59.2% in study carried in Pakistan by Ahmad Z, et al.^[4]

Surface epithelial tumors account for 50.0-55.0% of all ovarian tumors and their malignant forms for approximately 90.0% of all ovarian cancers in western world. Corresponding figure for Japan is 46.0-50.0% and 70-75% respectively.^[1] In this study surface epithelial tumors comprised 52% of all ovarian tumors.

In west, serous tumors account for about 30.0% of all ovarian neoplasm, 60.0% of these are benign, 10.0% are borderline and 30% are malignant. Similarly mucinous tumors account for 12.0-15.0% of all ovarian tumors in west. Approximately 75.0% mucinous tumors are benign, 10.0% are borderline and 15.0% are carcinomas.^[1] In this study serous tumors constituted 48% of all ovarian tumors. This figure was 42.9% and 32.7% other studies.^[3,5] Mucinous tumors here comprised 30% of all ovarian tumors whereas this figure were 25.5% and 25.0% in other studies.^[3,5] In this study, 36% of serous tumors were benign and 12% were malignant. Similarly 24.1% of mucinous tumors were benign and 6% were malignant. Borderline tumors were not seen. Like other studies, serous epithelial tumour was the commonest benign tumor and 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.^[6] in Malaysia, teratomas were commonest benign tumors among Malays and Chinese whereas serous cystadenoma was commonest among Indians.

We found that germ cell tumors comprised 14% of all ovarian neoplasms. 95.0% of ovarian germ cell tumors are mature cystic teratomas in the western world and only 3.0% of ovarian teratomas are immature ^[1,2]. Whereas our study showed 71.4 % of mature teratoma and 14.2% of immature teratoma. There were two case of thecoma, where one patient was of 20 years of age and second was of 61 years of age. The present study include only one case of firoma which is in comparison to the incidence noted by Gracy, et al.^[7] and one case of mixed tumour, cystadenomafibroma was present.

Sex cord stromal tumors account for 8.0% of all primary ovarian tumors.^[1] In our study it comprised 4.0% of all ovarian tumors. Literature shows that 70.0% metastatic ovarian tumors are bilateral and almost 10.0% of bilateral ovarian cancers are metastatic^[1] while this study showed, 41.33% of metastatic tumors were bilateral and 8.3% of bilateral ovarian cancers were metastatic. So in our study, some data approximated to data from the western world where as some approximated to that of neighboring countries like Nepal and Pakistan. Even results of two studies are different (Prabhakar BR, Maingi K, 1989; Pilli

GS et al., 2002). This study as well as studies from Nepal and Pakistan which are included here for comparison have small sample size whereas most data of western world is taken from results of large population based studies. This could be one cause of variation in results. There were two cases of krukenberg tumour in present study which form 2% of all ovarian neoplasm and 7.4% of malignant ovarian neoplasm which is comparable to Jagdeeshwari, et al., 1972.

Peak incidence of ovarian tumor is between 21-40 years.^[1,8] Benign ovarian tumors occur in all age group whereas malignant ovarian tumors are more common in elderly.^[8,9]

Conclusion

Benign tumors are more common than malignant ones for all age groups. Surface epithelial tumors are most common class of tumors in both benign and malignant tumour. Considering individual tumors, serous cystadenoma is the most common ovarian tumor overall as well as most common benign tumor whereas serous cystadenocarcinoma is most common malignancy. Germ cell tumors are seen in all age groups and are most common tumor up to 30 years. Malignant ovarian tumors are more common above 40 years. The incidences of bilateral neoplasm are more frequently seen in malignant tumors. 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 Indian women. So more study with larger sample size

should be done.

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