Journal of Saidu Medical College 2014; 4(2)

FREQUENCY AND HISTOLOGICAL TYPES OF OVARIAN NEOPLASIA IN PATHOLOGY DEPARTMENT, AYUB MEDICAL COLLEGE ABBOTTABAD.

MOHAMMAD SAJJAD[1], ABDUL GHAFOOR[2], MOHAMMAD AKRAM[3], ZARD ALI KHAN[4], SHAH JEHAN[5].

1. [1,4,5]Department of Pathology, Bannu Medical College Bannu.
2. [2]Department of Surgery, Bannu Medical College Bannu.
3. [3]Department of Community Medicine, Bannu Medical College Bannu.

ABSTRACT

BACKGROUND: Ovarian neoplasia are one of the commonest tumors in the world. The objective of study was to determine the frequency and histological types of ovarian neoplasia in biopsy specimen sent to Pathology Department, Ayub Medical College Abbottabad.

METHODOLOGY: This descriptive study was carried out in Pathology Department, Ayub Medical College Abbottabad. The duration of this study was one year (10.7.2012 to 10.7.2013) All the specimens were received in 10% buffered formalin, gross examination was performed and representative sections were taken. At least two blocks were made: slides were prepared and stained with hematoxylin and eosin stain. Diagnosis was recorded. The data were analyzed for frequency, ratio, percentage, mean and standard deviation.

RESULTS: In 100 ovarian tumors 81% were benign, 18% were malignant and 1% as metastatic. Most of the tumors (72%) were cystic on gross examination. Serous cystadenoma was the commonest benign tumor (33%) and mucinous adenocarcinoma was the commonest malignant tumor (9%). Benign cysts of no special type (NST) were 23%. Mean age for serous cystadenoma was 39.93 ± 15.73 and for mucinous cystadenocarcinoma was 48.75 ± 14.37 years. The mean age for benign cyst (NST) was 35.70 ± 10.13 years. Germ cell tumors especially dysgerminoma was found in early age groups (10 –20 years).

CONCLUSION: This study show general agreement with other national and international studies, where is Benign cyst (NST) which makes a significant percentage (23%) in this study and mucinous cystadenocarcinomas which was found to be the commonest malignant surface epithelial tumor in this study (9%) are present in frequencies higher than in local and western studies.

KEYWORDS: Ovarian Neoplasm, Serous Cystadenomas, Germ cell tumors.

INTRODUCTION

Ovarian neoplasia are the most common late discovered tumors of the body.[1] The reason is that there are no or little signs and symptoms at an early stage of the disease.[2] The risk of ovarian carcinoma increases with age.[3] The highest rates are above the age of 60 years. There is a two fold increased risk in women who have never had children or having previous breast cancer.[1,2] There are higher rates of ovarian cancer in industrialized countries except Japan and lower rates in developing countries.[1-3] Use of oral contraceptives (OC), early age at first pregnancy and early menopause decreases the risk of ovarian cancer.[4]

Regarding pathogenesis of ovarian cancer there are two theories. One is that increased number of ovulation increases the risk and oral contraceptives and pregnancy stop ovulation. The other theory is that circulating gonadotrophins increases the risk of ovarian cancer and such increased circulation occurs in menopause.[1,2]

Over 60% of ovarian neoplasia are epithelial in origin, 15-20% are of germ cells origin, about 5-10% are sex cord stromal tumors, whereas 5% are metastatic. About 90% of all ovarian malignant tumors are of common epithelial origin, 3-5% are of germ cell origin and 2-3% are of sex cord stromal origin.[1-4]

The surface epithelial tumors are more common after age of 40 years.[5] Germ cell tumors occur in childhood or young adulthood, while sex cord stromal tumors occur at any age.[5,6]

The prognosis of ovarian tumors depend upon the age of the patient, tumor type, stage of tumor, etc.[2,3] The overall survival for benign tumors is curative after surgical removal. In malignant ovarian tumors, overall five years survival is 25% in best hands. There is no ideal screening procedure for ovarian cancer like that of cervix.[3]

The present study was designed to observe the frequency of the various histological types of ovarian neoplasia at Ayub Medical College Abbottabad, Pakistan and to compare the same with other studies both at National and International level.

METHODOLOGY

This study was conducted in Histopathology section, Pathology Department of Ayub Medical College Abbottabad. This department receives approximately more than 3000 surgical specimens annually for histopathological diagnosis from 1000-bedded Ayub Teaching Hospital as well as from Civil and Private Hospitals of Hazara Division and Northern areas of Pakistan.The duration of this study was one year, from 10.7.2012 to 10.7.2013.

Specimen Selection: Specimens were obtained from all ovarian lesions . A total of 149 cases were obtained and the first 100 meeting the selection criteria were included in the study.Inclusion criteria was all tumors of ovary either primary or secondary irrespective of age were included. Exclusion Criteria was cystic follicles, follicular cysts, luteal cysts, endometritic cysts and autolysed specimens were not included in this study. All the specimens were received in 10% buffered formalin, labeled, representative sections taken and processed in ethanol, xyelene and paraffin wax, block prepared, freezed microtome sections 5 micron thick taken, slides prepared, stained with hematoxylin and eosin, mounted with DPX, labeled and reported by histopathologist

RESULTS

During this one-year period (10.7.2012 to 10.7.2013) 149 cases of ovarian specimens were received either alone or along with hysterectomy; out of these first hundred were selected after observing the inclusion and exclusion criteria. The results of these 100 ovarian tumors are summarized in the following tables 1-3.

Table –1 Gives the laterality of ovarian tumors. Out of 100 cases, in 78% cases the side of involvement was known; in 4% cases it was bilateral.

Table – 2 Gives the percentage of benign or malignant tumors. The ratio between benign and malignant tumors was 4.5:1.

Table – 3 Gives the various histological types of ovarian tumors i.e. the surface epithelial tumors were 80%, germ cell tumors were 15%, sex cord stromal tumors were 4% and metastatic were 1%.

Table – 1: Laterality of ovarian tumors (n = 100)

Laterality		No of Tumors	Percentage
Side Known	**Side known**	**78**	**78%**
Right	Right Side	30	38.5%
Left	Left Side	44	56.4%
Both sides	Bilateral	4	5.1%
Side unknown	**Side unknown**	**22**	**22%**

Table -2: Percentage of benign and malignant tumors in all patients (n= 100)

S.No	Type of tumor	No of tumor	Percentage
1	Benign	81	81%
2	Malignant	18	18%
3	Metastatic	01	01%
4	Total	100	100%

Table – 3: Histological types of different ovarian tumors (n = 100).

Type of Tumor	Overall (n = 100)	Reproductive age group (n = 61)	Post -menopausal age group (n = 24)
Surface epithelial tumors	**80 (80%)**	**49 (80.3%)**	**20 (83.3%)**
Serous cystadenoma	33 (41.25%)	21 (42.8%)	9 (45%)
Serous cyst adenocarcinoma	5 (6.25%)	2 (4.1%)	2 (10%)
Mucinous cystadenoma	10 (12.5%)	4 (8.2%)	4 (20%)
Mucinous cystadenocarcinoma	9 (11.25%)	4 (8.2%)	4 (20%)
Benign cyst (NST)	23 (28.75%)	18 (36.7%)	1 (5%)
Germ cell Tumors	**15 (15%)**	**11 (18.03%)**	**0 (0%)**
Mature teratoma	12 (80%)	9 (81.8%)	--
Dysgerminoma	2 (16.67%)	1 (9.1%)	--
Immature teratoma	1 (8.33%)	1 (9.1%)	--
Sex Cord Stromal Tumors	**4 (4%)**	**1 (1.64%)**	**3 (12.5%)**
Fibroma	3 (75%)	--	3 (100%)
Granulosa cell tumor	1 (25%)	1 (100%)	--
Metastatic Tumors	**1 (1%)**	**--**	**1 (4.2%)**

Results of Tests of Significance

All parameters of interest were tested by both T test and Chi square test as indicated for variable types. Only the following were significant:

- The difference of mean sizes of tumors between benign (9.79 ± 6.01 cm) and malignant (16.77 ± 4.46) groups was significant by Independent Samples T test, with a $p < 0.001$.
- The frequencies of cystic (benign 67/70, malignant 5/9) and solid (benign 3/70, malignant 4/9) appearances between benign and malignant tumors was significant by Chi Square test, with a $p < 0.001$.
- The frequencies of oophorectomy alone (benign 37/81, malignant 0/18) or oophorectomy with hysterectomy (benign 44/81, malignant 18/18) for benign and malignant tumors was significant by Chi Square test, with $p = 0.001$.

DISCUSSION

Ovarian neoplasia are common tumors in women.[7,8] They are about 25% of all gynecological malignancies. [61] Fifty percent of gynecological cancer deaths are due to ovarian malignancies. It is the 5th most common malignancy in females in USA. [8,21,22] According to WHO oovarian tumors arises from normal ovarian components and are devided into four major types. These are Surface epithelial tumors, Germ cells tumors, Sex cord stromal tumors and metastatic tumors. Most of the ovarians tumors are discovered incidently, some may cause abdominal discomfort and

distention, other may cause urogenital symptomatology. Prognosis depends on nature of tumors , all benign tumors are curative by surgical resection, where is malignant tumors prognosis depends on stage and grade of tumor.A special variant of tumor called krukenberg tumor is a distinctive bilateral metastatic to the ovaries by transceolomic spread characterized by mucous filled signet ring cells. In our surgical specimens of this institute, ovarian cancer ranks first amongst the gynecological malignancies, followed by endometrial and cervical malignancies (unpublished data).

According to Shahina et al it is the 4th most common cancer amongst females of Pakistan. [9]

Khan et al [10] reported ovarian cancer the 3rd most common cancer amongst overall female malignancies in KPK, while cancer of the breast and skin were ranking first and second in his study. Murad and Aziz et al [11,12] reported ovarian cancer as 2nd and 6th most common female cancers.

According to Armed Forces Institute of Pathology (AFIP) Rawalpindi, Pakistan and western study reported ovarian cancer (4.48%) the 5th commonest cancer observed after cancer of the breast (27.65%), skin (6.29%), cervix (4.76%) and white blood cells (4.61%). [13,14]

The ages of patients in our series ranged from 11 years to 85 years, with a mean age of 39.21 ± 15.61 years. There were 61 (61%) cases in the reproductive age group (14-45 years, mean age 31.92 ± 9.21 years) and 24 (24%) cases in the postmenopausal group (>45 years, mean age 58.90 ± 9.93 years). The difference in mean ages between the two groups was significant with $p < 0.001$.

In our study most of the tumors (44%) were from the left ovary, 30% were from right ovary, 4% were bilateral and in 22% laterality was not known.

In our study (4%) tumors were bilateral, where in Muzaffar et al [5] study 1.8% tumors were bilateral which show a mild difference between the two.

The number of benign tumors in our series was 81 (81%), while the number of malignant tumors was 18 (18%), and there was only 1 (1%) case of metastatic adenocarcinoma (table 2). The number of surface epithelial tumors was 80 (80%), germ cell tumors was 15 (15%), sex cord stromal tumors was 4 (4%). The benign malignant ratio was 4.5:1. This ratio is higher than that of 2.6:1 of Tariq et al. [7]

In this study, the surface epithelial tumors are slightly higher than other National and International studies (60-70%)[15,16]. The germ cell tumors are comparable with other National and International studies (15-20%). The same is true for sex cord stromal tumors.[17,18]

The single case of metastatic adenocarcinoma was found in a patient aged 85 years, and can be explained by age-related malignant disease other than in the ovary.

In this study, the commonest tumors were benign surface epithelial tumors comprising 66 (82.5%) tumors. Of the benign surface epithelial tumors, benign cysts (NST) were 23 (34.8%). Serous cystadenomas accounted for 33 (50%). Mucinous cystadenomas were 10 (15.15%) overall. The preponderance of benign cysts (NST) argues in favour of their being derived from other than surface epithelium, as the other surface epithelial tumors are less in the reproductive age group and more in the postmenopausal age group. They might have been distended, redundant and retained follicle or luteal cysts.

Among other benign tumors, fibromas are noticeable as they occur exclusively in the postmenopausal age group.

The most common malignant tumor was mucinous cystadenocarcinomas accounting for

9 (50%) of malignant tumors, followed by 5 (27.8%) cases of serous cystadenocarcinomas. Dysgerminomas accounted for 2 (11.1%) of malignant tumors, while Immature Teratoma and Granulosa cell tumor were 1 (5.5%) each.

In this study of 100 ovarian tumors 23% comprise of benign cysts (NST). The mean age of patients in these cystic lesions were 35.68 ± 10.13 years and the average size was 6.37 ± 3.31 cm.

In Yousaf et al [19] study of benign ovarian cysts at Fatima Jinnah Medical College, 21.3% of benign cysts were reported.
In Jamal et al [20] study in CMH Kharian Cantt, Pakistan, 7% of such benign cysts were reported.

In our present study the figure is almost equal to that of Yousaf et al study.

Amongst the malignant surface epithelial tumors, mucinous cystadenocarcinoma (47.36%) was the commonest, followed by serous cyst cystadenocarcinoma (26.31%). Among germ cell tumors, the dysgerminoma (10.55%) was the most common, followed by immature teratoma (5.20%), whereas in sex cord stromal tumors Granulosa cell tumor (5.20%) was the only malignant tumor.

In Ahmad et al [61] study of 855 ovarian tumors in 2000, serous cystadenoma (31.4%) was the 2nd common tumor whereas the 1st common benign tumor was mature teratoma (35.17%). The common malignant tumor was serous cystadenocarcinoma (30.5%) followed by mucinous cystadenocarcinoma (15.5%). The common malignant germ cell tumor was dysgerminoma (6.6%) and sex cord stromal tumor was granulosa cell tumor (6.9%).

According to Zaman et al [18] study of histological pattern of ovarian neoplasm in 1996, it was reported that the commonest benign surface epithelial tumor was serous cystadenoma (42.5%) followed by mucinous cystadenoma (17.5%). The common benign germ cell tumor was teratoma (30.5%) and fibroma (1.78%) of sex cord stromal origin. Amongst the malignant surface epithelial tumor mucinous cystadenocarcinoma (36.36%) was the commonest malignant tumor followed by serous cystadenocarcinoma (15.90%). The only malignant germ cell tumor was dysgerminoma (13.63%) and granulosa cell tumor (15.90%) was the only sex cord stromal malignant tumor.
Jamal et al [20] study of 110 ovarian tumors in 1997 reported serous cystadenoma (39.02%) as the commonest benign surface epithelial tumor, followed equally by mucinous cystadenoma and benign cyst (17.07% each). Amongst the malignant surface epithelial tumors, serous cystadenocarcinoma (38.46%) was followed by mucinous cystadenocarcinoma (23.07%). In germ cell tumors malignant teratoma and dysgerminoma were 7.69% each. Yolk sac tumor of sex cord stromal origin was 7.69%.

Saeed et al [16] in a study of 61 ovarian tumors in 1991 reported that the most common benign surface epithelial tumor was serous cystadenoma (38.09%), benign teratoma (38.1%) of germ cell origin followed by mucinous cystadenoma (18.18%). Amongst the malignant surface epithelial tumors, serous cystadenocarcinoma (27.5%) was followed by mucinous cystadenocarcinoma (25%).

According to Rashid et al [24] in a study of 102 malignant ovarian tumors, the commonest malignant surface epithelial tumor was serous cystadenocarcinoma (36.27%) followed by mucinous cystadenocarcinoma (30.39%). The common germ cell tumor was dysgerminoma (6.86%) and granulosa cell tumor (5.88%) of sex cord stromal origin.

In Jamal et al [25] study of 285 malignant ovarian tumors, mucinous cystadenocarcinoma (45%) was the commonest followed by serous cystadenocarcinoma (30%) and dysgerminoma (3.06%).
According to our study serous cystadenoma was the commonest surface epithelial tumor followed by benign cyst (NST). In some studies

benign teratoma was the commonest tumor followed by serous cystadenoma. [19] In this study benign cyst (NST) was the 2nd common epithelial tumor, whereas in other studies mucinous cystadenoma was the 2nd in frequency.

Amongst the malignant surface epithelial tumor in our study, mucinous cystadenocarcinoma was the commonest malignant tumor, as also reported by some other local studies, whereas serous cystadenocarcinoma was the common malignant tumor reported in other studies. [18]

The frequencies of germ cell tumors and sex cord stromal tumors were almost comparable with other National and International data available. [2, 4, 16-71, 18] In benign surface epithelial tumors, the mean age for serous cystadenoma was 39.93 ± 15.73 years, for mucinous cystadenoma 41.25 ± 15.48 years, whereas for malignant surface epithelial tumor the mean age was 50.0 ± 14.72 years for serous cystadenocarcinoma and 48.75 ± 14.37 years for mucinous cystadenocarcinoma. This age distribution is almost comparable with both National and International data. [26,

CONCLUSION

This study show general agreement with other national and international studies, where is Benign cyst (NST) which makes a significant percentage (23%) in this study as these were serous in type on gross examination but no labeling was made after thorough histological examination, these may be follicular/luteal cyst in their non secretory phase.

In addition mucinous cyst cystadenocarcinoma was found to be the commonest malignant surface epithelial tumor in this study (9%) which is contrary to some other local and western studies, where serous cystadenocarcinoma was the common malignant tumor.

REFERENCES

1. Philip B, Clement MD, Robert H, Young MD. Atlas of gynecologic surgical pathology. 3rd ed Elsevier, 2013; 3231 – 482.
2. Rosai J. Female Reproductive system. In: Ackerman's surgical Pathology 10th ed. St. Louis, Missouri: Mosby Year-Book Inc., 2011; 1319-540.
3. Khan RI. Tumors of the Ovary. In: Text Book of Gynecology. 3rd ed. Boston: Medical Publication, 2000; 219-33.
4. Kumar V,Abbass AK, Aster CJ.Female genital tract. In: Robin's pathological basis of diseases. 9th ed.Philadelphia:WB Saunders,2013; 628-704.
5. Muzaffar M, Malik IA, Ashraf S. A Clinicopathological study of 107 ovarian tumors. J Pak Med Assoc 1987; 37(8): 194-7.
6. Langman J. Urogenital system. In: Medical Embryology. 4th ed. London: 1981; 244-53.
7. Tariq N, Alam SM. Medical audit of the frequency of ovarian tumors. J Surg Pak (international) 1998; 3(1):26-7.
8. Ahmad Z, Kayani N, Hassan S, Muzzaffar H, Gill MS. Histological pattern of ovarian neoplasia. J Pak Med Assoc 2000; 50(12): 416-9.
9. Parveen S, Ilyas N, Asghar S. Pattern of care for ovarian cancer patients at INMOL Lahore. SPECIALIST 1999; 15(3): 209-15.
10. Khan SM, Gillan J, Nasreen S, Zai S. Cancer in north west Pakistan and Afghan refuges. J Pak Med Assoc; 1997; 47: 122-24.
11. Murad A. Ovulation induction & ovarian tumors. J Pak Med Assoc 1998; 48(11): 353-6.
12. Aziz Z, Sana S, Saeed S, Akram M. Institution based tumor registry from Punjab: Five-year data based analysis. J Pak Med Assoc 2003; 53(8): 320-78.
13. Ahmad M, Khan AH, Mansoor A. The pattern of malignant tumors in northern Pakistan. J. Pak Med Assoc 1999; 41: 270-73.
14. Annegars JF, strom H, Decker DC, Dockerty MB, O'Fallon WM. Ovarian cancer: Incidence & case control study. Cancer 1979; 43: 723-9.
15. Siddiqui RI, Jafaray SN. Pattern of female genital tact malignancy at a private tertiary hospital. J Pak Med Assoc 1998; 48(2): 51-3.
16. Saeed M, Khawaja K, Rizwan I. Clinicopathological analysis of ovarian tumors. J Pak Med Assoc 1991; 41: 161-64.
17. Alam I, Waqar F, Khan A, Begum N. Prevalence & management of ovarian tumors in women & children Hospital Abbottabad. J Ayub Med Coll Abbottabad 2001; 13(2): 19-21.
18. Zaman S. Histological pattern of ovarian neoplasm. A dissertation in partial fulfillment of the requirement for FCPS II. CPSP Karachi; 1996.
19. Yousaf NW, Rehman R, Imran A. Benign ovarian cysts - A retrospective evaluation over two years. J Pak Med Assoc 1995; 45(3): 61-3.

20. Jamal S, Quddusi H, Mehmood A. A clinicopathological analysis of 110 ovarian tumors. SPECIALIST 1997; 14(1): 19-23
21. Ahmed J. Hashmi MA, Naveed IA. Spectrum of malignancies in Faisalabad 1986-90. Pak J Pathol 1992; 3:130-
22. Malik IA, Khan WA, Khan ZK. Patterns of malignant tumors observed in a university hospital: a retrospective analysis. J Pak Med Assoc 1998; 48(2): 120-24.

CORRESPONDENCE ADDRESS
Name:Dr Mohammad Sajjad
Address: Associat Professor Pathology, Department of Pathology, Bannu Medical College Bannu KPK, Pakistan.
Email:sajjadkhattak66@gmail.com
Cell No: 0333-9343645