HISTOPATHOLOGIC PATTERN OF OVARIAN TUMORS IN VARIOUS AGE GROUPS

Mir Attaullah Khan[1], Hamid Ullah Shah[2], Abdul Qayyum[3], Ejaz Hassan Khan[4]

[1] Department of Pathology, Gajju Khan Medical College, Swabi - Pakistan.
[2] Department of Pathology, Lady Reading Hospital, Peshawar – Pakistan.
[3] Department of Surgery, Lady Reading Hospital, Peshawar – Pakistan.
[4] Principal, Khyber Medical College Peshawar - Pakistan.
Address for Correspondence:
Dr. Mir Attaullah Khan
Associate Professor, Department of Pathology, Gajju Khan Medical College, Swabi - Pakistan,
Email: drmirattaullah@yahoo.com
Date Received:
September 25, 2016
Date Revised:
May 15, 2017
Date Accepted:
May 25, 2017

ABSTRACT

Objective: To study the histopathologic pattern of ovarian tumors in different age groups.

Methodology: This retrospective study was conducted on 300 cases with histopathologically proven ovarian tumors reported in histopathology section of Department of Pathology, Lady Reading Hospital (LRH) Peshawar, from 1st January 2011 to 31st December 2015. All the patients operated at LRH or somewhere else by any surgical procedure, but their specimens being processed in histopathology section of LRH, were included in the study. Autolysed specimens and those with unremarkable histologic findings were excluded from the study. For histopathological patterning, classification system of the World Health Organization (WHO) for ovarian tumors was applied. Hematoxylin and eosin stains were used for histological study of the tissues.

Results: During the study period, 300 specimens of ovarian tumors were received in the department of Pathology LRH Peshawar. Mean age of the patients was 35.2 ±7.46 years ranging from 6-70 years. Eighty three percent (250) tumors were benign, 1.7% (5) were borderline and 15% (45) were malignant. Most common (80%) tumors of both benign and malignant origin were surface epithelial tumors followed by germ cell tumors (18.7%). Benign surface epithelial tumors comprised 80% (200/250) of all benign tumors whereas their malignant counterparts comprised 78% (35/45) of all malignant tumors.

Conclusion: Among the histomorphologic variants of ovarian tumors, benign tumors are more common than malignant ones for all age groups. Surface epithelial tumors are the most common tumors out of both benign and malignant classes. Benign tumors are common in young age below 40 years while malignant ones are common above 40 years of age.

Key Words: Tumor, Ovary, Benign, Malignant, Hematoxylin, Eosin

INTRODUCTION

Ovarian tumors are among the common tumors of women. They are considered as one of the most important causes for referral to gynecology units in all hospitals providing this care[1]. Most of the ovarian tumors (about 2/3) occur in women of child bearing age group[2] and are usually diagnosed at an advanced stage, due to late presentation[2-4]. Both western and asian countries have different frequencies of various ovarian tumors with seventy five to eighty percent of them being benign[2]. In developed countries these tumors constitute 25% of all the gynecologic tumors. Similarly ovarian cancer is the 2nd and 3rd commonest malignancy among malignancies of the female genital tract, in developed and developing countries respectively[5]. Regarding causation of these tumors infertility, advanced age and family history are considered to be the risk factors for surface epithelial cancers while increased parity, tubal ligation, hysterectomy and use of oral contraceptive pills are considered to be the protective factors against these tumors. Risk of germ cell ovarian cancer is high in those girls and young women, the mothers of whom had used hormones during their pregnancies, had increased body mass or were teen agers at the time of pregnancy[1]. Exact incidence of ovarian cancer in Pakistan is unknown due to non existence of data registration system but from several local studies it has been ranked as fourth commonest cancer[4]. It is very important to diagnose ovarian lesions at an early stage. For this purpose many diagnostic modalities like history, bimanual examination, ultrasound, CT scan, MRI and measurement of serum CA 125 (tumor marker) are available but it is the histopathologic evaluation of the tissue biopsy that is considered as gold standard for definitive diagnosis of these tumors[6,7].

Histologically ovarian tumors exhibit a wide variation in their spectrum from benign to borderline to malignant[1,7]. This variation both in clinical and morphological manifestations is because of the origin of these tumors from different cell lineages[8]. Morphologically common benign ovarian tumors include cysts (both follicular and luteal) followed by serous cyst adenomas and mucinous cyst adenomas[4]. Among the malignant ovarian tumors, surface epithelial malignancies followed by germ cells cancers are the commonest malignancies. Ovarian cancer of surface epithelial origin is one of the commonest malignancies of female pelvic region causing death[2]. The aim of this study was to determine the frequency of various morphological types of ovarian tumors in different age groups in our set up.

METHODOLOGY

This was a retrospective study conducted at histopathology section of the Department of Pathology, Lady Reading Hospital (LRH), Peshawar. Its duration spread over five years starting from 1st January 2011 to 31st December 2015. Laboratory request forms and histopathology reports of patients having ovarian tumors were retrieved from the record and were analyzed for different histopathologic types on the basis of their origin in relation to age. The Department of Histopathology had a standardized procedure regarding processing, block formation, sectioning, staining the slides, evaluation and final diagnosis of these specimens. All the biopsy specimens were processed in the same way to authenticate the results. For this purpose sections of all the biopsy specimens were fixed in formalin, embedded in paraffin and stained with hematoxylin and eosin before microscopic examination.

All the patients who had cystectomy, oophorectomy or hysterectomy with bilateral or unilateral salphingo-oophorectomy for ovarian tumors in isolation or in association with uterine pathology whether operated

in LRH or somewhere else but their specimens were received and handled in the histopathology laboratory of LRH Peshawar were included in the study. Patients having inadequate or autolysed specimens or unavailable records of histopathological examination were excluded from the study. Data regarding age and pre-surgical findings on ultrasound or CT scan in favor of benign or malignant ovarian tumor was obtained from the request forms. Age wise patients were divided into six groups to study the proportion of various ovarian tumors in them and to determine the predominant histologic type in each age group. First age group was of ≤20 years and the last one of >60 years. Rest of the four groups were made between 21-60 years each having a ten years gap. Data was collected, fed into and analyzed by Microsoft Excel software.

RESULTS

During the five years study period from January 2011 to December 2015, three hundred cases of ovarian tumors were diagnosed. Age of the patients, parity and their histopathologic diagnoses (benign, borderline and malignant) were obtained from the record. Age of the youngest patient in our study was 6 years while that of the oldest one was 70 years. Mean age was 35.2 ±7.46 years. Most commonly affected age group by ovarian tumors was that of 21 to 30 years followed by age group of 31 to 40 years. Regarding age of patients most of the benign tumors (106/250 or 42.4%) occurred in reproductive age group of 21-40 years. Among the malignant tumors most of the tumors (33/45 or 73.3%) occurred after 40 years of age. Detail is given in table 1.

Out of the total 300 ovarian tumors 250 were benign while 45 were malignant. Complete distribution of different categories is shown in (figure1).

Parity was also given consideration regarding frequency of ovarian tumors in females having different number of children. Maximum number of both benign

Figure 1: Distribution of all ovarian tumors on the basis of their nature
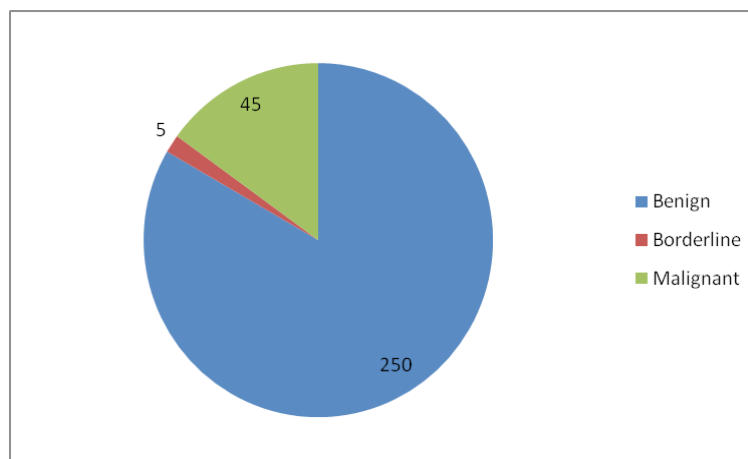
Table 1: Distribution of ovarian tumors (based on nature) in relation to various age groups (n=300)

Class of tumors	To-tal	Types	≤20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs	>60 yrs	Total
Surface Epithelial tumors	240	Benign	20	50	44	35	28	23	200
		Borderline	0	0	05	0	0	0	05
		Malignant	01	2	02	11	15	04	35
Germ cell tumors	56	Benign	13	01	10	17	06	02	49
		Malignant	01	02	02	01	01	0	07
Sex cord stromal tumors	03	Benign	0	01	0	0	0	0	01
		Malignant	0	02	0	0	0	0	02
Metastatic tumors	01	Malignant	0	0	0	0	01	0	01
Total	300		35	58	63	64	51	29	300

Table 2: Distribution of ovarian tumors according to parity (n=300)

Parity	Benign	Borderline	Malignant	Total (%)
0-2	110	2	18	130 (43.3%)
3-5	88	3	14	105 (35%)
6 +	52	0	13	65 (21.7%)
Total (%)	250	05	45	300 (100%)

Table 3: Frequency of different types and sub-types of ovarian tumors on the basis of origin (n =300).

Histologic type of ovarian tumors	Benign tumors (n=250)	Borderline tumors (n=5)	Malignant tumors (n=45)	Total	%age
Surface epithelial tumors	Serous cyst adenoma (130) Mucinous cystadenoma (70)	Border line serous cystadeno-carcinoma (05)	Serous cystadenocarcinomas (14) Mucinous cystadenocarcinomas (07) Endometrioid carcinomas (07) Clear cell carcinomas (01) Malignant Brenner tumors (03) Papilary cystadenocarcinomas (03)	240	80%
Germ cell tumors	Dermoid cyst (32) Mature teratoma (17)	--	Yolk sac tumors (03) Dysgerminoma (01) Choriocarcinomas (02) Teratocarcinoma (01)	56	18.7%
Sex cord stromal tumors	Fibrothecoma (01)	--	Granulosa cell tumor (02)	03	1%
Metastatic tumors	--	--	Krukenberg tumor (01)	01	0.3%
Total	250	05	45	300	100%

and malignant ovarian tumors were found in females having children less than two in number i.e. 110 (36.7%) and 18 (6%)respectively (Table 2). Surface epithelial tumors out-numbered the other tumors counting to be 240 /300 (80%) in number. They were followed by the tumors of gem cell origin (56/300 or 18.7 %). Detailed distribution of all the histologic types and their break up into different benign and malignant morphologic sub-types is shown in table 3.

DISCUSSION

Ovarian tumors constitute a major portion of all gynaecological tumors. Ovarian cancer is the leading cause of death in females despite advances in diagnostic approaches and management protocols. Due to a variety of pathologic conditions of ovary having same clinical and radiologic findings as those of its tumors, the diagnosis of ovarian tumors may be difficult. Therefore accurate and timely diagnosis in such cases by a histopathologist, after studying their biopsy specimens, is very important to avoid complications and to save life of the patient at large.

Most of ovarian neoplasms in the present study were benign (83.3%), followed by malignant (15%) and borderline (1.7%) tumors. Malignant surface epithelial tumors constituted the largest group (35/45). Out of these 35 malignant surface epithelial tumors serous carcinoma was the predominant subtype making 40 % (14/35) of them. These findings are in close approximation to those observed in the study conducted by Khan and Luqman[9] that has shown 76% of ovarian tumors to be benign and 34.78% cases of all malignant surface epithelial tumors to be the serous carcinomas. Another study by Gupta et al[10] has reported similar result about benign tumors i.e 72.9% but slightly high result (4.1%) for borderline tumors. Other similar study conducted by Rettenmaier et al[11] has also reported a higher proportion (nearly 20%) of borderline ovarian tumors. This difference may be due to variation in sample size and/or involvement of environmental, socio-economical and genetic factors in their causation.

In our study age of the patients ranged from 6-70 years with a mean age of 35.2 ±7.46 years for all categories, 33.2 years for benign tumors and 48.5 for malignant tumors. Similar results have been shown by the study conducted by Banyopadhyay et al[7]. A higher median age of 60-65 years for malignant tumors has been reported from India and the western countries[12,13]. This may be due to increase in absolute number of older women in these studies. In our study most of the benign tumors (106/250 or 42.4%) were diagnosed in patients between 21-40 years of age whereas most of the malignant tumors (33/50 or 66%) were noted in patients above 40 years of age. Arshad et al[5] in their study have shown similar results i.e.47.2% of benign tumors to be found in patients having age between 21 and 40 years while 73.1% of malignant tumors to be noted in patients above 40 years of age. Similar observations have also been made in other studies[14,15]. This shows an importance of investigating any vague abdominal symptom in women of this age group. In women of these age groups complaints are attributable to a variety of conditions and thus symptoms are usually neglected or attributed to some other problems[16].

Our study showed surface epithelial tumors to be the largest group (240/300). Among these serous tumors were found to be more common (149/240) than mucinous tumors (77/240). This finding well correlates with that of other studies[17,18]. Two other studies conducted by Khanum et al[19] and Aziz et al[20] have also observed similar findings regarding serous tumors.

In our study frequency of malignant tumors was higher (14/300) for serous cyst adenocarcinoma followed by mucinous cystadenocarcinoma (07/300). Similar results have been shown by other studies[21,22]. One study conducted by Yasmeen et al shows an endometrioid carcinoma to be more prevalent as compared to serous one[23]. Second largest group (56/300 or 18.7%) in our study was constituted by germ cell tumors (GCTs) of both benign and malignant nature. Among all the benign GCTs (n=49) dermoid cysts were the commonest (32/49) followed by mature teratomas (17/49). A study conducted by Ahmad et al[21] has also documented dermoid cysts to be the most common GCT, whereas Thanikasalanm et al[24] have shown mature teratomas to be the commonest GCT.

Metastatic tumors were the least common (1/300 or 0.33%) in our study next to sex cord stromal tumors (SCSTs) (3/300 or 1%). Other studies[20,25] have also shown SCSTs to be 1% as compared to other major types. Tanwani et al[22] have documented 10.1% cases of SCSTs in their study. Variability in sample size, genetic factors or change of geographic locality may be the reason for this difference.

CONCLUSION

In our study, benign tumors were more common than malignant tumors in all age groups. Major group of tumors was constituted by tumors of surface epithelial cell origin. Mature cystic teratoma was the most common benign tumor while serous adenocarcinoma was the commonest malignant tumor among surface epithelial tumors. Tumors of germ cell origin constituted the second common group of tumors followed by a group of sex cord stromal tumors. The group of metastatic tumors constituted the least common group of ovarian tumors. Malignant surface epithelial tumors were mostly seen after the 4th decade of age while malignant germ cell tumors were observed before the 4th decade of age.

REFERENCES

1. Farooq F, Noman D, Humayun N, Naveed N, Haider A. Demographic differentials and histopathological patterns of ovarian masses. Biomedica 2015; 31:118-23

2. Jha R, karki S. Hhistological pattern of ovarian tumors and their age distribution. Nepal Med Coll J 2008; 10: 81-5.

3. Ashraf A, Sheikh S, Ishfaq A, Akram A, Kamal F, Ahmad N.

The relative frequency and histopathological pattern of ovarian masses. Biomedica 2012; 28:98-102.

4. Sohail I, Hayat Z, Saeed S. A comparative analysis of frequency and patterns of ovarian tumors at a tertiary care hospital between two different study periods (2002-2009). J Post grad Med Inst 2012; 26:196-200.

5. Arshad M, Niazi S. Frequency and histological spectrum of malignant ovarian tumors at King Edward Medical University, Lahore. Biomedica 2015; 31: 269-76.

6. Jaffar Y, Ehsan N, Ambreen. Clinical presentation of ovarian tumors. J Surg Pak 2013; 18: 82-5.

7. Mondal SK, Banyopadhyay R, Nag DR, Roychowdhury S, Mondal PK, Sinha SK. Histologic pattern, bilaterality and clinical evaluation of 957 ovarian neoplasms: a 10-year study in a tertiary hospital of Eastern India. J Can Res Ther 2011; 7:433-7.

8. Vaidya S, Sharma P, KC S, Vaidya SA. Spectrum of ovarian tumors in a referral hospital in Nepal. J Pathol Nepal 2014; 4:539-43.

9. Khan AA, Luqman M, Jamal S, Mamoon N, Mushtaq S. Clinico pathological analysis of Ovaria tumors. Pak J Pathol 2005; 16:28-32.

10. Gupta N, Bisht D, Agarwal AK, Sharma VK. Retrospective and prospective study of ovarian tumors and tumor-like lesions. Indian J Pathol Microbiol 2007; 50:525-7.

11. Rettenmaier MA, Lopez K, Abaid LN, Brown JV 3rd, Micha JP, Goldstein BH. Borderline ovarian tumors and extended patient follow-up: An individual institution's experience. J Surg Oncol 2010; 101:18-21.

12. Murthy NS, Shalini S, Suman G, Pruthvish S, Mathew A. Changing trends in incidence of ovarian cancer - the Indian scenario. Asian Pac J Cancer Prev 2009; 10:1025-30.

13. Quirk JT, Natarajan N. Ovarian cancer incidence in the United States, 1992-99. Gynecol Oncol 2005; 97:519-23.

14. Scully RE, Young RH, Clement PB, (eds). Tumors of the ovary, maldeveloped gonads, fallopian tube and broad ligament, Atlas of Tumor Pathology. 3rd Ed. Fascicle 23 Robert E. Armed Forces Inst Pathol, Washington DC 1999; 189:145.

15. Amatya S, Gurung G, Rana A. Annual Clinicopathological Analysis of Ovarian tumors at TUTH. Nepal J Obs Gynae 2010; 4:18-24.

16. Yancik R. Ovarian cancer. Age contrasts in incidence, histology, disease stage at diagnosis and mortality. Cancer 1993; 71:517-23.

17. Yasmin S, Yasmin A, Asif M. Clinicopathological pattern of ovarian tumors in Peshawer region. J Ayub Med Coll Abbottabaad 2008; 20:11-13.

18. Prabarker BR, Maingi K. Ovarian tumors – prevalence in Punjab. Indian J Pathol Microbiol 1989; 32:276-81.

19. Khanum Z, Rehman A. The prevalence and age distribution of ovarian cysts. Ann King Edward Med Uni 2005; 11:392-3.

20. Aziz F. Malik M, Yousaf N. The pattern of ovarian malignancies – a retrospective study over a period of three years. A retrospective study over a period of three years. Ann King Edward Med Uni 1999; 5:276-8.

21. Ahmad Z, Kayani N, Hasan SH, Muzaffar S, Gill MS. Histopathological pattern of ovarian neoplasm. J Pak Med Assoc 2000; 50:416-9.

22. Tanwani AK. Prevalence and pattern of ovarian lesions. Ann Pak Inst Med Sci 2005; 1:211-4.

23. Pisani P. Burden of cancer in developing countries. IARC Scient Pub 1994; 129: 31-9.

24. Thanikasalam K, Ho CM, Adeed N, Shahidan MN, Azizah WK. Pattern of ovarian tumors among Malaysian women at General Hospital, Kuala Lumpur. Med J Malaysia 1992; 47:139-46.

25. Zahra F. Pattern of ovarian masses. Ann King Edward Med Coll 2006; 12:480-2.