International Journal of Research in Medical Sciences
Sheikh S et al. Int J Res Med Sci. 2017 May;5(5):2110-2114
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20171852

Original Research Article

Histopathological spectrum of ovarian tumours from a referral hospital in Kashmir valley, Jammu and Kashmir, India

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Received: 20 February 2017
Revised: 25 March 2017
Accepted: 27 March 2017

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ABSTRACT

Background: Ovary is a complex structure and its neoplasms show a wide spectrum of histological types and clinical behaviour. The present study was done with the aim of studying the histopathological pattern of the ovarian tumours in women of various age groups.
Methods: This was prospective study conducted over a period of 2 years from Jan 2015 to Dec 2016 and included 193 cases of ovarian neoplasms.
Results: Of 193 cases 155 (80.3%) were benign, 8 (4.1%) were borderline and 30 (15.5%) were malignant tumours. Surface epithelial tumours constituted majority of the tumours (64.7%). Mature cystic teratoma (30.6%%) was the most common benign tumour followed by serous cyst adenoma (26.9%). Serous cyst adenocarcinoma (7.8%) was the most common malignant tumour of the ovary. While tumours were seen over a wide range of 6-75 years, >80% of benign tumours were seen in patients of <40 years and 60% of malignant tumours were seen in patients of >40 years of age.
Conclusions: The findings of present study are comparable to the published data from the subcontinent.

Keywords: Mature cystic teratoma, Ovarian tumors, Surface epithelial

INTRODUCTION

Ovarian tumours are one of the major health problems representing 30% of cancers of female genital tract.[1] It is the most complex tumour of women in terms of histiogenesis, clinical behaviour and malignant potentiality and represents the sixth most common female cancer and the fourth leading cause of death due to cancers in women.[2]

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.[3] In a recent hospital based study in our Kashmir valley carcinoma of the ovary was observed to be the fourth most common cancer in females.[4] No age is exempted from developing ovarian tumours.

Benign ovarian tumours may occur at any point in life but they are most common during childbearing age of 20 and 45 years whereas malignant tumours are more common in older women, between the ages of 45 and 65 years.[5,6]

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

Present institution is a tertiary care unit and bulk of Gynecological cases from the valley come to our Gynae and Obstetrics department.

METHODS

This was a prospective observational study conducted in the department of Pathology, Government Medical College, Srinagar, Jammu and Kashmir, India over a period of two years (January 2014 to December 2016). All the cases of ovarian tumours (cystectomy, oopherectomy, hysterectomy with uni of bilateral salphingo opherectomy) which were received in the department of pathology were included in the study.

Functional ovarian cysts were excluded from the study. Complete clinical data of the patients was recorded. The specimens received were examined externally and then grossed after overnight fixation in 10% formalin. Minimum of four sections from the tumour were taken. The tissue was processed as per standard procedure. 4-5 micrometer thick sections were cut on microtome and stained by Haematoxylin and Eosin stain to get detailed information about the morphology of the lesion. Special stains were used, when required.

The tumours were studied and classified as per the WHO classification of ovarian tumours (2003).[1]

RESULTS

One hundred ninety-three cases of ovarian tumours were studied during a 2-year period of 2015 and 2016. Of the 193 cases, 155 (80.3%) were benign, 8 (4.1%) were borderline and 30 (15.5%) cases were malignant. The age range of our patients was from 6-75 years with the youngest patient as a case of mature cystic teratoma and oldest as a case of Mucinous cystadenoma.

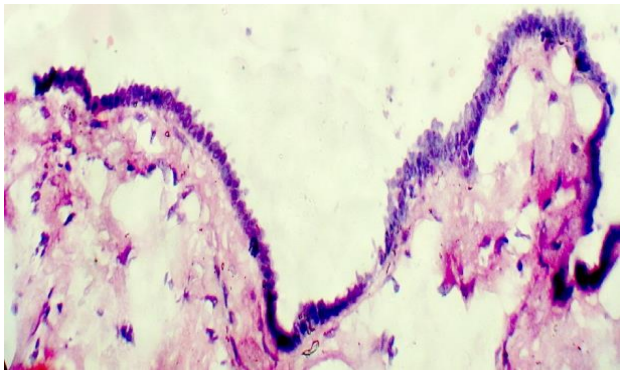

Figure 1: Serous cystadenoma. Cystwall with lining epithelium composed of cuboidal to low columnar cells. (H&E-400X).

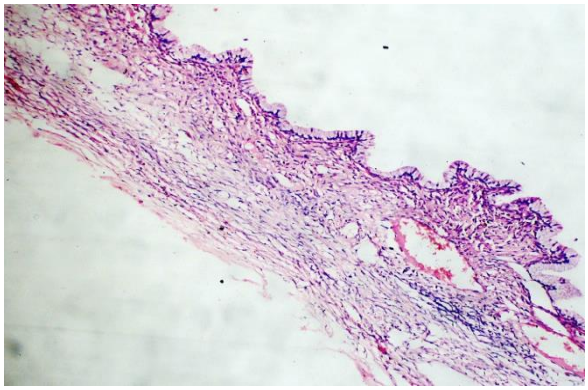

Figure 2: Mucinous cystadenoma. Cyst wall lined by columnar cells with basally placed nucleus and apical mucin (H&E-100X).

Table 1: Distribution of ovarian tumours in various age groups.

Age group (in years)	Type			Total (n=193)
	Benign (n=155)	Borderline / un-certain behaviour (n=8)	Malignant (n=30)	
0-10	1 (0.6%)	0 (0.0%)	0 (0.0%)	1 (0.5%)
11-20	14 (9.0%)	1 (14.3%)	3 (10.0%)	18 (9.3%)
21-30	75 (48.4%)	4 (50.0%)	5 (16.7%)	84 (43.5%)
31-40	37 (23.9%)	2 (25.0%)	4 (13.3%)	43 (22.3%)
41-50	17 (11.0%)	0 (0.0%)	7 (23.3%)	24 (12.4%)
51-60	4 (2.6%)	1 (12.5%)	7 (23.3%)	12 (6.2%)
61-70	5 (3.2%)	0 (0.0%)	4 (13.3%)	9 (4.7%)
71-80	2 (1.3%)	0 (0.0%)	0 (0.0%)	2 (1.0%)
Total	155 (100.0%)	8 (100.0%)	30 (100%)	193 (100.0%)

Maximum number of cases were seen in the child bearing age group of 21-30 years, 84 cases (43.5%), and 30-40 years, 43 cases (22.3%). The malignant neoplasms, 14 cases (46.6% of malignant cases), in present study were seen more commonly in the age group of 40-60 years (Table 1). In the present study, the tumours ranged in size from 3-27cm with an average size of 9.39 cm. Of 193 tumours, 140 (72.5%) were cystic, 39 (20.2%) were mixed and 14 (7.3%) were solid. All the cystic tumours were benign, 13 of the 39 cases with mixed consistency were benign and 23 were malignant, whereas out of 14 solid tumours 6 were benign and 7 malignant. Adopting

WHO classification, the surface epithelial tumours were most common accounting for 125 case (54.8%) followed by germ cell tumours 60 cases (31.1%), sex cord stromal tumours 6 cases (3.1%) and metastasis 2 cases (1%).[7] Table 2 shows the distribution of tumours as per WHO classification 2003 and their relative frequency.

Table 2: Distribution of ovarian tumours as per WHO classification (n=193).

Histological type	Number (percentage)
Surface epithelial tumours	125 (64.8%)
Benign	94 (48.7%)
Serous cystadenoma	52 (26.9%)
Serous cystadeno-fibroma	12 (6.2%)
Mucinous cystadenoma	29 (15.0%)
Benign brenner tumour	1 (0.5%)
Borderline	4 (2.1%)
Borderline serous cystadenoma	1 (0.5%)
Borderline mucinous cystadenoma	3 (1.6%)
Malignant	27 (14.0%)
Serous cystadenocarcinoma	15 (7.8%)
Mucinous cystadenocarcinoma	8 (4.1%)
Endometroid cystadeno-fibroma with microinvasion	1 (0.5%)
Transitional cell carcinoma	2 (1.0%)
Clear cell carcinoma	1 (0.5%)
Germ cell tumours	60 (31.1%)
Benign	59 (30.6%)
Mature cystic teratoma	59 (30.6%)
Malignant	1 (0.5%)
Dysgerminoma	1 (0.5%)
Sex cord stromal tumour	6 (3.1%)
Benign	2 (1.0%)
Fibroma	1 (0.5%)
Fibrothecoma	1 (0.5%)
Borderline (uncertain behaviour)	4 (2.1%)
Granulosa cell tumour	2 (1.0%)
Sertoli cell tumour	2 (1.0%)
Metastatic tumours (Adenocarcinoma and signet ring cell carcinoma)	2 (1.0%)
Total	193 (100.0%)

DISCUSSION

Ovarian neoplasm is the most fascinating tumour of the women in terms of histiogenesis, clinical behaviour and malignant potentiality. Many of the of the ovarian neoplasms cannot be detected early in their development, they account for a disproportionate number of fatal cancers, being responsible for almost half of deaths from cancer of female genital tract.[1] Histomorphological classification of ovarian tumours forms an integral part of the evaluation of the neoplasms.[7] The present study was conducted on 193 cases and the main aspects considered in it were histopathological type as per WHO classification and frequency of different histopathological types in different age groups.[6]

The tumours were seen the age group from 6-75 years with maximum number of cases in 21-30 years, 43.5%, followed by 31-40 years, 22.5%. Similar observations were made by Saxena et al and Jagadeshwari et al.[19,20] Most of the benign neoplasms were seen in 3rd and 4th decade with mean age of 32.75 years. Malignant neoplasms were expectedly seen with advancing age, peaking in 5th and 6th decade of life with mean age of presentation being 43.86 years. A study by Murthy NS et al, involving data across various cities in India, revealed that the incidence of ovarian cancer increases from 35 years of age reaching its peak between 55-64 years.[3] Though similar age related trends were followed by malignant tumours in our study but a fair percentage (26.7%) of malignant neoplasms especially surface epithelial adenocarcinomas was also seen in younger age groups (<30 years). This can be attributed to the possible effects of environmental and life style changes adopted by younger population.

About 91.9% cases were unilateral and 8.8% case were bilateral. Bilaterality was observed almost equally among benign and malignant neoplasms with 82.4% of bilateral tumours being surface epithelial in nature. Comparable results were seen in a study by Pilli GS et al and Prabhakar and Maingi.[8]

WHO classification of ovarian tumours is based on the tissue of origin of the tumours which have been found to arise from one of three ovarian components: (1) surface epithelium (2) the germ cells and (3) the stroma of the ovary. Of the three main groups, epithelial tumours are the most common with serous and mucinous cystadenomas being the commonest epithelial tumours. The single most common ovarian tumor is a germ cell tumor, the benign cystic teratoma, and all other types of germ cell tumours, including malignant germ cell tumours, are rare. Sex cord– stromal tumors are less frequently observed group of ovarian tumours. Of these tumours fibromas, thecomas and granulosa cell are significant. Other sex cord–stromal tumors are rare.6 In our study, surface epithelial tumours was commonest group of tumours, constituting about 64.5 % of ovarian tumours, followed by germ cell tumours (31.1%), sex cord stromal tumours (3.1%) and metastatic tumours (1%). Of the epithelial tumous serous cystadenoma (Figure 1) and mucinous cystadenoma (Figure 2) were the commonest tumours comprising 41.96% of tumours. Most of the malignant tumours, about 90% were also of the epithelial origin. Mature cystic teratoma (30.6%) and Dysgerminoma (0.5%) were the only Germ cell tumours observed in our series. Sex cord stromal tumours comprised of fibroma (0.5%), thecoma (0.5%), granulosa cell tumour (1%) and sertoli cell tumour (1%). While fibromas and thecomas behave in a benign manner, the

behaviour of granulosa cell tumour and sertoli cell tumour is uncertain because of their potential in behaving aggressively. Many authors from the subcontinent have observed similar frequencies of the tumours in their respective studies.[8,10,11]

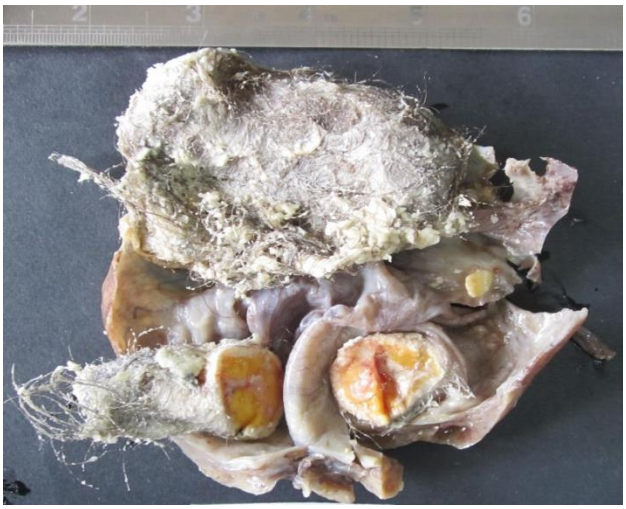

Figure 3: Mature cystic teratoma. Admixture of sebum and hair within the cavity. A well-developed tooth is also seen.

Out of 193 cases, 156 (80.85) were benign, 7 (3.6%) were borderline/uncertain behaviour and 30 cases (15.5%) were malignant. In a study by Gupta SC et al the benign tumours constituted 59.4% of cases with a high incidence of malignant tumours (40.6%) whereas comparable results were obtained in studies by N Gupta et al and Maheswari V et al where benign tumours constituted 71.9% in each study, borderline tumours constituted 4.4% and 4.1%, and malignant tumours constituted 23.7% and 22.9% of tumors respectively.[10,12,13]

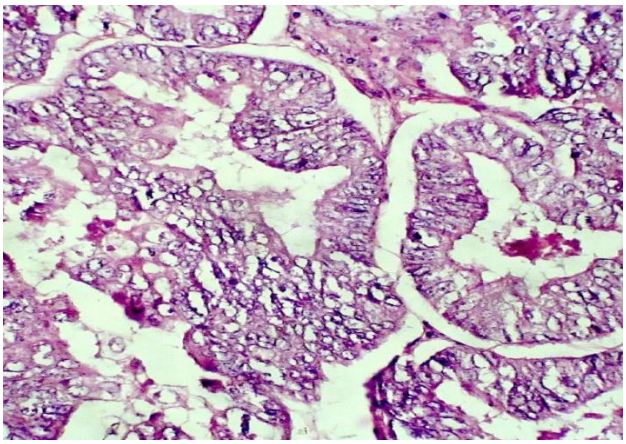

Figure 4: Papillary serous cystadenocarcinoma. Photomicrograph showing papillary fronds lined by tumour cells (H&E-100x).

Mature cystic teratoma (Figure 3) was the commonest benign tumour in our study followed by serous cystadenoma. However, studies from the subcontinent have shown serous cystadenoma to be the most common benign neoplasm.[10,11,14] A study by Thaniksalam has shown serous cystadenoma to be the commonest neoplasm in Indian population while as mature cystic teratoma to be commonest among Malayas and Chinese.[15] In many Napelese Studies mature cystic teratoma was the commonest benign ovarian tumour.[16-18] Among malignant tumours surface epithelial adenocarcinomas (Figure 4) were the commonest malignancies of the ovary constituting 14% of ovarian tumours with serous cystadenocarcinomas being most frequent occurrence.

CONCLUSION

Though surface epithelial tumours was the most frequently occurring group of tumours but mature cystic teratoma was the most common tumour seen in present study. Serous cyst adenonacarcinoma was the commonest malignant neoplasm of the ovary and was seen in 5th and 6th decades of life. Occurrence of malignant epithelial tumours in younger age groups was also noted warranting larger population based studies to verify the above findings and also define risk factors and identify the etiological factors.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Sheikh S, Bashir H, Farooq S, Beigh A, Manzoor F, Reshi R. Histopathological spectrum of ovarian tumours from a referral hospital in Kashmir valley, Jammu and Kashmir, India. Int J Res Med Sci 2017;5:2110-4.