

THE RELATIVE FREQUENCY AND HISTOPATHOLOGICAL PATTERN OF OVARIAN MASSES:

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ABSTRACT

Background: Ovarian tumours are one of the major causes of gynaecological problems in females and present marked variation in their histological types. Relative frequency of these lesions is different for Western and Asian countries. This study was designed to find out frequency of various histological patterns of ovarian tumors in patients attending Pathology Department of a teaching institute in Lahore. *Material and Methods:* A retrospective case – series study was conducted on 212 cases of ovarian masses, reported from January 2007 to December 2010. *Results:* Mean age of the subjects was 35.6 years, ranging from 4 to 80 years. In a total of 212 cases of ovarian masses, 85 (40.09%) were non-neoplastic and 127 (59.91%) were neoplastic. Among neoplastic lesions, 64.57% (82/127) were benign and 35.43% (45/127) were malignant. The commonest non-neoplastic lesion was luteal cyst (38/85) followed by simple serous cyst (30/85). The commonest benign tumour was dermoid cyst (31/82) followed by serous cystadenomas (20/82). The commonest malignant tumour was serous cystadenocarcinoma (11/45) followed by mucinous cystadenocarcinoma (9/45). *Conclusion:* Neoplastic lesions were more common than non-neoplastic lesions, while benign tumours outnumbered the malignant ones. The commonest benign tumour was dermoid cyst and malignant was serous cystadenocarcinoma. The commonest non-neoplastic lesion was luteal cyst. Among histological types of ovarian tumours, surface epithelial tumours dominated the other types.

Key Words: Ovarian tumours, luteal cyst, serous cyst, dermoid cyst, cystadenocarcinoma.

INTRODUCTION

The incidence of cancer is increasing in developing countries.^{1,2} There are marked differences in distribution of different cancers in different regions of the world.^{2,3} Ovarian cancer is the most frequent cause of death from gynaecological cancers and the fourth most frequent cause of death from cancer in women in Europe, United States⁴ and Eastern India.⁵ Exact incidence in Pakistan is not known, but ovarian cancer is the 4th most common cancer among females of Pakistan and continues to present at an advanced age.⁶ The lifetime risk of ovarian cancer in women with no family history is 1.6%; with one affected first degree relative is 5%,⁷ and 7% with two or more affected first degree relatives.⁸ Ovarian tumours are insidious in onset and usually diagnosed at a late stage. They are rare in young age group.⁹ They commonly present with abdominal pain, a lump or menstrual irregularities.¹⁰ In addition to biopsy, various diagnostic modalities include transvaginal ultrasonography, MRI, positron emission tomography,¹¹ and markers like serum CA 125.⁸

Diverse histopathologies are common in ovarian lesions. Relative frequency of different ovarian tumors is different for western world and Asian countries.

For example surface epithelial tumors account for 50.0 – 55.0% of all ovarian tumors and their malignant counterpart for approximately 90.0% of all ovarian cancers in Western world whereas this figure is 46.0 – 50.0% and 70.0 – 75.0% respectively in Japan. Similarly mucinous tumors account for 12.0 – 15.0% of all ovarian tumors in Western world. This figure is 20.0 – 23.0% for Japan. Germ cell tumors account for 30.0% of primary ovarian tumors and malignant germ cell tumors account for 3.0% of all ovarian cancers in Western world.¹² Determination of these patterns is important for diagnosis, management and prognosis.

This study was conducted to find out the histopathological patterns of ovarian lesions in patients attending a teaching hospital, in Lahore, Pakistan.

MATERIALS AND METHODS

A retrospective case – series study was carried out on 212 patients who had undergone surgical oophorectomy. Samples were analysed in the Pathology department of Fatima Jinnah Medical College, Lahore. All histopathologically diagnosed cases of ovarian lesions referred to this department during January 2007 to December 2010 were included in this

study. These were mostly referred from gynaecology and obstetric department of Sir Ganga Ram Hospital, Lahore, but a few were referred from other hospitals in the vicinity. The data was retrieved from the record files of pathology department. Patients with abdomino – pelvic masses other than of ovarian tumours diagnosed on histopathology were excluded from the study. The histological characterisation of ovarian tumour was done according to the International Classification of Diseases, 9th ed. (ICD-9) (WHO Classification, 1995).¹³ The acquired data was analysed using the descriptive statistics.

RESULTS

During the study period from January 2007 to December 2010, two hundred and twelve consecutive cases of ovarian lesions were selected. Ages of the patients and their histopathology diagnoses were recorded. Patients were divided into eight age groups, with a difference of 10 years in each group. The commonest age group affected was from 21 to 30 years followed by age group from 31 to 40 years. The youngest patient was 4 years old and the oldest was 80 years old. Mean age was 35.6 years (Table 1).

Table 1: Age distribution of cases of ovarian mass (n = 212; mean age = 35.6 years).

Age (years)	No. of Cases	Percentage
1 – 10	01	0.47
11 – 20	27	12.74
21 – 30	64	30.19
31 – 40	48	22.64
41 – 50	39	18.40
51 – 60	22	10.38
61 – 70	08	3.77
71 – 80	03	1.41
Total	212	100%

In a total of 212 ovarian lesions, 85 (40.09%) were non-neoplastic and 127 (59.91%) were neoplastic. The neoplastic lesions comprised 82/127 (64.57%) benign and 45/127 (35.43%) malignant tumours (Fig. 1).

In non-neoplastic lesions, luteal cyst was the predominant category (38/85; 44.70%) followed by simple serous cyst (30/85; 35.29%) (Table 2).

The neoplastic tumours were divided in four groups, namely, epithelial tumours, germ cell tumours, sex cord stromal tumours and metastatic tumours. Epithelial tumours were maximum in number

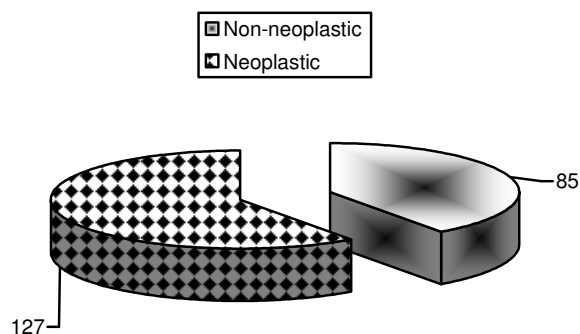


Fig. 1: Distribution of Neoplastic and Non-Neoplastic Ovarian Masses (n = 212).

Table 2: Distribution of various types of non-neoplastic ovarian lesions (n = 85).

Non-neoplastic Lesions	No. of Cases	Percentage
Luteal cysts	38	44.70
Simple serous cyst	30	35.29
Salpingo-oophoritis	7	8.24
Endometriosis	8	9.42
Hemorrhagic cyst	2	2.35
Total	85	100%

(67/ 127; 52.76%), followed by Germ cell tumours (55/127; 43.31%) (Table 3).

Frequency pattern of different classes and subtypes of benign and malignant ovarian neoplasms (n = 127) is show in table 4. The commonest histological class is surface epithelial tumours (67/127; 52.76%) followed by germ cell tumours (55/127; 43.31%). Among all the benign lesions (n = 82), dermoid cyst is the commonest (31/82), while serous cyst adenoma is at the second number (20/82). On the other hand, among all the malignant lesions

Table 3: Distribution of various classes of ovarian tumours (n = 127).

Classes of Ovarian Tumours	No. of Cases	Percentage
Epithelial	67	52.76
Germ cell tumour	55	43.31
Sex cord stromal tumour	4	3.15
Metastatic tumours	1	0.78
Total	127	(100)

Table 4: Frequency of different classes of benign and malignant ovarian tumours. (n = 127; No. of cases of each histological type is given in parenthesis).

Histological Classes of Ovarian Tumours	Benign Tumours (n = 82)	Malignant Tumours (n = 45)	Total	(%)
Surface epithelial Tumour	Serous cyst adenoma (20) Mucinous cyst adenoma (13)	Serous cyst adenocarcinoma (11) Mucinous cyst adenocarcinoma (09) Endometrioid carcinoma (07) Papillary cyst adenocarcinoma (03) Clear cell carcinoma (02) Malignant Brenner tumours (02)	67	(52.76)
Germ Cell tumour	Dermoid cyst (31) Mature teratoma (17)	Yolk sac tumours (03) Dysgerminoma (02) Mixed YST and choriocarcinoma (1) Teratocarcinoma (1)	55	(43.31)
Sex cord stromal Tumor	Sclerosing stromal tumour (01)	Granulose cell tumours (03)	4	(3.15)
Metastatic tumour	-----	Krukenberg tumour (01)	1	(0.78)
Total	82	45	127	(100)

(n = 45), serous cyst adenocarcinoma is at the top (11/45), followed with a little difference by mucinous cyst adenocarcinoma (09/45) and endometrioid carcinoma (07/45) respectively.

DISCUSSION

Age range of our subjects was from 4 to 80 years and mean age was 35.6 years. Mean age observed in our study is lower than that observed in few other studies carried out in Pakistan.^{7,13,14} These studies document mean ages as 48.1, 49.5, and 48.1 years respectively. Our study shows the maximum incidence of ovarian masses between 21 and 40 years of age. This differs from the western data where it is between 50 and 70 years¹⁶ but correlates with other studies conducted in Pakistan.¹⁷⁻¹⁹

In our study non-neoplastic lesions were 40.09% (85/212) and neoplastic lesions were 59.91% (127/212). Neoplastic lesions contained 64.57% (82/127) benign and 35.43% (45/127) malignant. Tanwani²⁰ documented 31.4% non-neoplastic lesions, 46.4% benign tumours and 22.2% malignant tumours. Among non-neoplastic lesion, luteal cyst was most common (44.70%, 38/82) followed by simple serous cysts (35.29%, 30/82) in our study. The pattern of distribution of non-neoplastic lesions is quite variable in other studies, for example incidence of endometriotic cysts were 3% and 20%^{19,20} respectively, haemorrhagic cysts 80%¹⁹ and follicular cyst 27.86%.²¹

Among the 127 neoplastic lesions in our study, 64.57% were benign and 35.43% were malignant. The higher incidence of benign tumours is also do-

documented in various other studies,^{19,21,22} where it is 85%, 78%, 89.7% and 72.73% respectively and ratio of benign to malignant tumours is higher in these studies as compared to our study. No borderline tumor was found in our study.

Among the major histological classes, the commonest type of ovarian neoplasm seen in our study was surface epithelial tumours, whether benign or malignant (67/127; 52.76%). Our finding is closer to the observations made in several other studies i.e. 64%, 66% and 70%^{7,24,25} respectively. However, Guppy et al²⁶ documented a higher incidence of epithelial tumours than in our study i.e. 90%. Germ cell tumours (GCT) in our study were 43.31%. This value is quite high as compared to Western data (370)⁴ and data collected from other parts of Pakistan (1470)¹⁶ and (27.13%).⁷ This difference may be due to variations in sample size but genetic, socio-economical and environmental factors may also be involved. The frequency of sex – cord – stromal tumours (SCST) in our study was 3.15%. This value is comparable with that of studies carried out in the west (5%)²⁷ and other parts of Pakistan (370).¹⁶

Our study showed that serous tumours (whether benign or malignant) were more common than mucinous tumours (31/67 vs 22/67 cases). This finding correlates with other studies.^{28,29} The studies carried out by Khanum and Rehman²² and Aziz et al¹⁸ also observed serous cyst-adenomas to be the commonest tumours. The frequency of malignant tumours in our study was highest for serous cyst adenocarcinoma (11/67) followed by mucinous cyst adenocarcinoma (09/ 67). Similar pattern of distri-

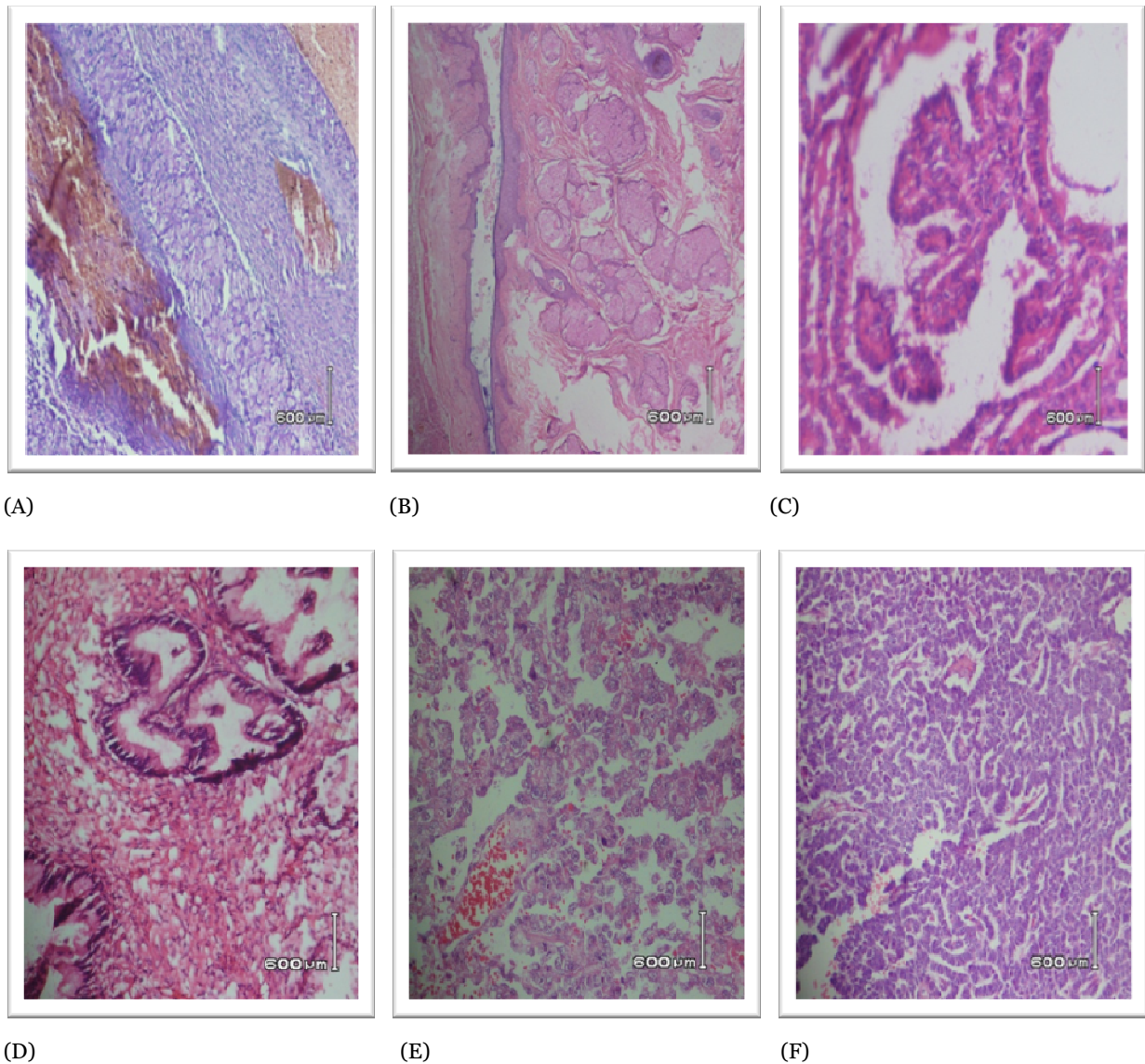


Fig. 1: Microphotographs of Ovarian Lesions. A. Luteal cyst (most common non-neoplastic lesion). B. Dermoid cyst (most common benign neoplasm). C. Serous cystadenocarcinoma (most common malignant neoplasm). D. Mucinous cystadenocarcinoma. E. Yolk sac tumor. F. Granulosa cell tumour.

bution of malignant tumors are shown by many other studies.^{7,20} However, Study conducted by Yasmeen et al shows endometrioid carcinoma to be more prevalent.²¹

Germ cell tumours (GCTs) comprise the second largest group in our study in which benign tumours dominated the malignant ones (48 vs 07 /55). Among the benign GCTs our study showed the highest incidence of dermoid cysts followed by mature teratomas (31 and 17/55 respectively). A study conducted by Ahmad et al⁷ in Pakistan also documents dermoid cysts to be the commonest GCT, whereas the study of Thanikasalanm et al³⁰ conducted in India shows teratomas to be the predominant GCT.

Sex cord stromal tumours (SCSTs) were the least common in our study, next to metastatic tumours (4/127; 3.15%). The incidence of these tumours is variable in other studies. Zohra^{18,19} found only 1% SCSTs while Tanwani²⁰ documents 10.1% cases of SCST. Granulosa cell tumours were the commonest SCSTs in our study (3/4) while studies carried out by Yasmeen et al²¹ and Ahmad et al³¹ mentioned a variable incidence of 28.5% and 5.62% respectively.

In *conclusion* according to this study ovarian tumours are common in age group of 21 to 40 years. Neoplastic lesions are more common than non-neoplastic lesions. Luteal cyst is the commonest non-neoplastic lesion. Among the histological classes of

neoplastic lesions, surface epithelial tumours are predominant type, followed by germ cell tumors. The commonest benign tumour is dermoid cyst and commonest malignant tumour is serous cystadenocarcinoma. This study is institutional – based, therefore the results obtained may or may not reflect the actual histological pattern of ovarian tumours in Pakistani women. Therefore, multicentric study with larger sample size should be carried out.

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