RESEARCH ARTICLE

Spectrum of Ovarian Lesions: A 3-year Retrospective Study in a Tertiary Care Center in Northwest India

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ABSTRACT

Aim: This study was undertaken to determine the frequency of ovarian lesions and their clinicohistological features.

Materials and methods: A retrospective study was conducted for a period of 3 years on 1,844 cases of ovarian lesions in Jawaharlal Nehru Medical College, Ajmer, from July 2013 to June 2016. The specimens were analyzed macroscopically and studied microscopically. The non-neoplastic and neoplastic lesions were classified as per standard protocols.

Results: In a total 1,844 cases of ovarian masses, 1,736 (94.14%) were non-neoplastic and 108 (5.86%) were neoplastic. Among neoplastic lesions, 71.29% (77/108) were benign, 2.78% (3/108) were borderline, and 25.93% (28/108) were malignant. The commonest non-neoplastic lesion was follicular cyst (66.59%) followed by corpus luteal cyst (26.73%). Surface epithelial tumor was the commonest histological type of ovarian neoplasm. The commonest benign tumor was serous cystadenoma (30/77) followed by dermoid cyst (28/77). The commonest malignant tumor was serous cystadenocarcinoma (8/28) followed by metastatic tumors to ovary (7/28). Mean age of the subjects was 41.54 years, ranging from 9 to 76 years.

Conclusion: Non-neoplastic lesions outnumbered the neoplastic ones. Among the neoplastic lesions, epithelial histology was the dominant type. Only a provisional diagnosis can be made on clinical grounds, exact specification of the lesion requires its histopathological examination.

Clinical significance: Histopathological findings of ovarian lesions are further helpful in treatment and prognosis of the patients.

Keywords: Neoplastic, Non-neoplastic, Ovarian lesions.

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INTRODUCTION

The ovary is a complex and dynamic organ and, between the ages of approximately 11 and 50 years, is responsible for follicle maturation, ovulation, and cyclical sex steroid hormone production. These complex and linked biological functions are coordinated through a variety of cells within the ovary, each of which possesses neoplastic potential.

Ovarian enlargements, cystic or solid, may occur at any age. Functional and inflammatory enlargements of the ovary develop almost exclusively during the child-bearing years.[1] These are of transient duration and may be either asymptomatic or cause local discomfort, menstrual problems, or infertility.

A wide variety of diverse ovarian tumors are known to arise from the ovary. Many of these harbor a malignant potential. These tumors are often asymptomatic to begin with and are often advanced by the time they are diagnosed.[2]

Ovarian lesion is a common cause of hospital admissions presenting great diagnostic and surgical challenges to the gynecologists. Ovarian malignancy has the highest fatality-to-case ratio of all the gynecologic malignancies.[3] Each of the histologic variants of ovarian tumors is distinct with unique molecular features. So, diagnosis of various histological patterns of ovarian lesions is very important for treatment and prognosis. Ovarian tumors offer a good field for research, as early diagnosis is quite difficult due to inaccessible site, asymptomatic nature, and the limited use of various new techniques.

OBJECTIVES

- To find out the frequency of ovarian pathology;
- To correlate the ovarian pathology with different age groups; and
- To correlate the ovarian pathology with clinical features.

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MATERIALS AND METHODS

The present retrospective study was based on histo-pathological evaluation of 1,844 cases of ovarian lesions received at the Department of Pathology, Jawaharlal Nehru Medical College, Ajmer, over a period of 3 years, i.e., July 2013 to June 2016. Relevant clinical information regarding age, clinical features, radiological findings, and provisional diagnosis was obtained. The specimens were analyzed macroscopically for various parameters like consistency, cut sections, external surface, size, and contents. The gross specimens received were fixed in 10% formalin, and multiple sections from each specimen were taken which were processed by routine paraffin method and stained with conventional hematoxylin and eosin (H&E) stain.

The non-neoplastic and neoplastic lesions from representative sections were studied and classified as per standard protocols.

RESULTS

A total number of 1,844 cases were studied. Among these, 1,736 (94.14%) were non-neoplastic and 108 (5.86%) cases were neoplastic (Graph 1).

Two-thirds of the non-neoplastic lesions were follicular cysts (1,156 cases = 66.59%), whereas corpus luteal cysts (464 = 26.73% cases) accounted for approximately one-fourth of the non-neoplastic lesions of ovary (Table 1).

Of the 108 neoplastic lesions, 77 cases (71.29%) were benign, 3 cases (2.78%) were borderline, and 28 cases (25.93%) were malignant (Graph 2). The commonest histological pattern observed in neoplastic lesions was epithelial tumors (60.19%) followed by germ cell tumors (29.63%). The most common benign ovarian tumors found in our study were serous cystadenoma (30 cases = 27.78%) followed by dermoid cyst (28 cases = 25.93%).

Table 1: Frequency of non-neoplastic lesions of ovary

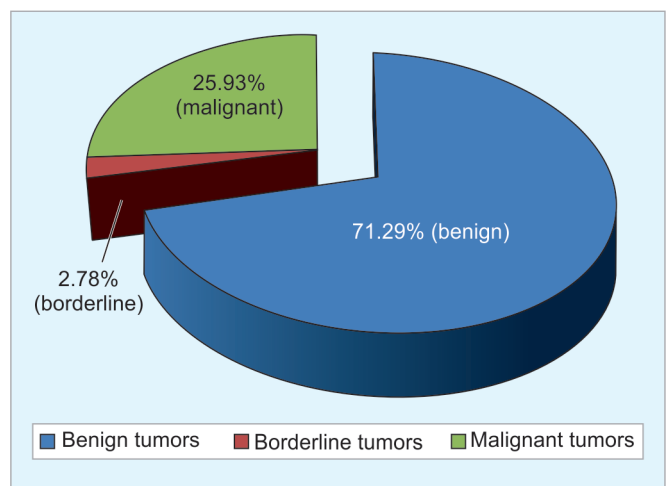| Types of non-neoplastic lesions (n = 1,736)	Number	Percentage
Follicular cyst	1,156	66.59
Corpus luteal cyst	464	26.73
Endometriosis	64	3.69
Inclusion cyst	52	2.99
Total	1,736	100

Table 2: Frequency of ovarian neoplasms

Types of neoplastic lesions	Number	Percentage
I Epithelial ovarian tumors	65	60.19
A. Serous tumors	41	37.96
• Serous cystadenoma	27	25
• Serous papillary cystadenoma	3	2.78
• Borderline serous tumor	3	2.78
• Serous cystadenocarcinoma	8	7.41
B. Mucinous tumors	20	18.52
• Mucinous cystadenoma	12	11.11
• Mucinous papillary cystadenoma	5	4.63
• Mucinous cystadenocarcinoma	3	2.78
C. Endometrioid adenocarcinoma	4	3.70
II Germ cell tumors	32	29.63
• Benign cystic teratoma	28	25.93
• Dysgerminoma	3	2.78
• Struma ovarii	1	0.93
III Sex cord stromal tumors	4	3.70
• Granulosa cell tumor	3	2.78
• Fibroma	1	0.93
IV Metastatic tumors	7	6.48
Total	108	100

There were three cases of borderline category (2.78%), which were borderline serous tumor. The most common malignant ovarian tumor was serous cystadenocarcinoma (8 cases = 7.41%) followed by metastatic tumors (7 cases = 6.48%; Table 2).
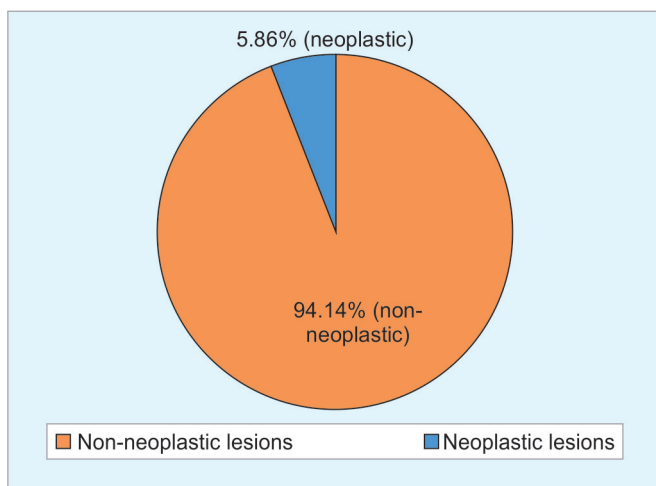
Graph 1: Distribution of neoplastic and non-neoplastic lesions in ovarian specimens

Graph 2: Distribution of benign and malignant ovarian tumors

Table 3: Age distribution of the cases

Age of patients (in years)	Overall number of cases (n = 1844)	Non-neoplastic lesions (n = 1736)	Neoplastic lesions (n = 108)	Benign tumors (n = 77)	Borderline tumors (n = 3)	Malignant tumors (n = 28)
Prepubertal (<10)	12 (0.65%)	3 (0.17%)	9 (8.33%)	7 (9.09%)	0 (0.00%)	2 (7.14%)
Adolescent (11–19)	58 (3.14%)	43 (2.48%)	15 (13.89%)	10 (12.99%)	0 (0.00%)	5 (17.86%)
Adult (20–39)	738 (40.02%)	724 (41.71%)	14 (12.96%)	10 (12.99%)	0 (0.00%)	4 (14.28%)
Perimenopausal (40–59)	905 (49.08%)	864 (49.77%)	41 (37.96%)	31 (40.26%)	3 (100%)	7 (25.00%)
Menopausal (≥60)	131 (7.10%)	102 (5.87%)	29 (26.85%)	19 (24.67%)	0 (0.00%)	10 (35.71%)

Table 4: Chief presenting complaints of the cases

Chief symptoms	Overall number of cases (n = 1,844)	Non-neoplastic lesions (n = 1,736)	Neoplastic lesions (n = 108)	Benign ovarian tumors (n = 77)	Borderline ovarian tumors (n = 3)	Malignant ovarian tumors (n = 28)
Pain in abdomen	551 (29.88%)	527 (30.36%)	24 (22.22%)	15 (19.48%)	2 (66.67%)	7 (25%)
Lump in abdomen/ abdominal swelling	105 (5.69%)	69 (3.97%)	36 (33.33%)	27 (35.06%)	0	9 (32.14%)
Menstrual disturbances	1,036 (56.18%)	1,014 (58.41%)	22 (20.37%)	19 (24.68%)	0	3 (10.71%)
Gastrointestinal disturbances	57 (3.09%)	50 (2.88%)	7 (6.48%)	6 (7.79%)	0	1 (3.57%)
Urinary problems	28 (1.52%)	18 (1.04%)	10 (9.26%)	9 (11.69%)	0	1 (3.57%)
Weight loss	7 (0.38%)	0 (0.00%)	7 (6.48%)	0	0	7 (25%)
Incidental findings	60 (3.25%)	58 (3.34%)	2 (1.85%)	1 (1.29%)	1 (33.33%)	0 (0%)

About half of the population in the study sample (905 cases = 49.08%) were perimenopausal, which was the age group commonest for both neoplastic and non-neoplastic lesions (40–59 years; Table 3).

The commonest chief presenting complaint for non-neoplastic lesions was menstrual disturbances (1,014 cases = 58.41%), whereas it was abdominal swelling/ lump for the neoplastic ones (38 cases = 35.18%). Overall 3.25% cases (60/1,844) were found incidentally on ultrasonography done due to some other reasons, of which 3.34% (58/1,736) were non-neoplastic and 1.85% (2/108) were neoplastic (Table 4).

DISCUSSION

Ovarian mass is a commonly encountered gynecological problem. The clinical presentations of both non-neoplastic and neoplastic lesions of ovary are similar and findings in ultrasonography are also confusing sometimes. Many a times, tumor markers are helpful, but exact diagnosis can never be made based upon the investigations and clinical findings. So, ovarian masses are frequently removed surgically either as oophorectomies or with hysterectomies. The histopathological findings of these ovarian lesions are helpful in further management of the patients.

In our study 1,844 ovarian lesions were evaluated to find out the incidence of malignancy, histological category of the ovarian lesions, age distribution, marital status, parity, the chief presenting complaint, and correlation of radiological findings with the type of lesions.

The present study showed that 94.14% ovarian lesions were non-neoplastic (1,736/1,844). The incidences of non-neoplastic lesions were 51.72, 87.3, 43.7, and 40.09% in studies conducted by Kanthikar et al,[4] Pudasaini et al,[5] Gurung et al,[6] and Ashraf et al[7] respectively. The most common non-neoplastic lesion in our study was follicular cyst (66.59%), which was similar to the study done by Kanthikar et al[4] (74.6%). Gurung et al[6] reported endometriotic cyst (39%) as the most common non-neoplastic lesion, whereas Ashraf et al[7] found corpus luteal cyst being the most frequent (44.7%) non-neoplastic lesion in their studies.

The incidence of endometriosis in ovarian lesions was 3.69% in our study, which was 5.9, 9.42%, and as high as 39% in studies done by Pudasaini et al,[5] Ashraf et al,[7] and Gurung et al[6] respectively.

About 5.86% of all the ovarian lesions were neoplastic (108/1,844) in our study, whereas incidences of neoplastic ovarian lesions were 48.28, 12.7, 56.3, and 59.9% respectively, in studies done by Kanthikar et al,[4] Pudasaini et al,[5] Gurung et al,[6] and Ashraf et al.[7] Among histopathologic types, the commonest category of the ovarian tumors encountered in our study was epithelial tumors (60.19%) followed by germ cell tumors (29.63%). This pattern was similar to those found in studies done by Kanthikar et al[4] (epithelial type 67.14%; germ cell type 22.85%) and Pudasaini et al[5] (epithelial type 69.5%; germ cell type 19.5%). Ashraf et al[7] also found epithelial type as the most common histologic type (52.76%) followed by

Table 5: Incidence of marital status and parity distribution

Marital status and parity	Overall number of cases (n = 1,844)	Non-neoplastic lesions (n = 1,736)	Neoplastic lesions (n = 108)	Benign tumors (n = 77)	Borderline tumors (n = 3)	Malignant tumors (n = 28)
Unmarried	26 (1.41%)	15 (0.86%)	11 (10.18%)	7 (9.09%)	0 (0.00%)	3 (10.71%)
Nulliparous	54 (2.93%)	39 (2.25%)	15 (13.89%)	10 (12.99%)	1 (33.33%)	5 (17.86%)
Parity 1	143 (7.75%)	129 (7.43%)	14 (12.96%)	11 (14.28%)	0 (0.00%)	3 (10.71%)
Parity 2	482 (26.14%)	453 (26.09%)	29 (26.85%)	22 (28.57%)	2 (66.67%)	5 (17.86%)
Parity 3	470 (25.49%)	458 (26.38%)	12 (11.11%)	9 (11.68%)	0 (0.00%)	3 (10.71%)
Parity 4	393 (21.31%)	381 (21.95%)	12 (11.11%)	10 (12.99%)	0 (0.00%)	2 (7.14%)
Parity 5 and above	276 (14.97%)	261 (15.03%)	15 (13.89%)	8 (10.39%)	0 (0.00%)	7 (25.00%)

germ cell tumors (43.31%), but Gurung et al[6] found germ cell tumor as the most common histologic type (52.63%) followed by epithelial type (47.37%).

Among the 108 neoplastic lesions in our study, 71.29% were benign, 2.78% borderline, and 25.93% were malignant. The higher incidence of benign tumors is also documented in various other studies, viz., Kanthikar et al[4] (78.57%), Yogambal et al[8] (78.6%), and Ashraf et al[7] (64.57%). In our study, three cases (2.78%) of ovarian tumors were of borderline category. Kanthikar et al,[4] Yogambal et al,[8] Gurung et al,[6] and Ashraf et al[7] reported 1.42, 0.75, 1.5, and 0% of the ovarian tumors as borderline in their studies respectively. Our study reported serous cystadenoma as the most common benign ovarian neoplasm (27.78%), which was also reported by Kanthikar et al,[4] Yogambal et al,[8] and Pudasaini et al.[5] However, Gurung et al[6] and Ashraf et al[7] found dermoid cyst as the most common benign ovarian tumor in their series. In our study, the most frequently found malignant ovarian neoplasm was serous cystadenocarcinoma (7.41%) followed by metastatic tumors to the ovary (6.48%). Serous cystadenocarcinoma was again the most commonly reported malignancy in ovaries by Kanthikar et al,[4] Yogambal et al,[8] Pudasaini et al,[5] Gurung et al,[6] and Ashraf et al.[7] The incidence of secondaries to the ovary in various studies were 4.28%,[4] 0.75%,[8] 6.9%[5], and 0.78%.[7]

Most of the patients presented with more than one symptom. So, chief presenting complaint was taken into account. In our series, menstrual disturbance was the chief complaint for maximum number of patients having non-neoplastic lesions (58.41%) followed by pain in abdomen (30.36%). This corroborates with the study done by Kanthikar et al.[4] Neoplastic lesions presented mostly with abdominal swelling/lump followed by pain in abdomen in our study. Yogambal et al,[8] however, studied pain in abdomen as the most common symptom of ovarian tumor, which was followed by abdominal lump. Only seven patients (6.48%) with ovarian tumors came with weight loss as the major complaint in our study, which was comparable to the study of Kanthikar et al[4] (5.45%).

In our study, the age range of patients was 9 to 76 years. The maximum incidence of non-neoplastic (49.77%) and neoplastic (37.96%) lesions of ovary including benign ovarian masses (40.2%) was found in perimenopausal group (40–59 years). However, malignant cases (35.71%) presented mostly in menopausal age group (≥60 years). Dermoid cyst was the most common ovarian tumor found in adult age group (20–39 years) in our study.

It is a well-known fact that nulliparity is associated with ovarian malignancy. In the present study, 10.71% of malignant cases (3/28) were unmarried (including 2 in prepubertal age group; Table 5).

CONCLUSION

The lack of specific symptoms and signs and early screening modalities create confusion in exact diagnosis of the types of ovarian lesions. These ovarian lesions present from prepubertal to postmenopausal age and very commonly require excision. The distinction of non-neoplastic from neoplastic lesions and that again benign from malignant ones cannot always be made certainly based on radiological features, tumor markers, and gross appearance during surgery. However, a sound knowledge of the microscopic features is essential for an accurate diagnosis which finally becomes helpful in management and prognosis of the patients. With the help of radiological, clinical, and other laboratory findings, unnecessary surgeries can be avoided in cases of non-neoplastic ovarian lesions, which can be managed conservatively.

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