Original Research Article

Pattern of neoplastic and non-neoplastic lesions of ovary: a five-year study in a tertiary care centre of rural india

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ABSTRACT

Background: Most common ovarian lesions include benign non-neoplastic lesions including functional cysts and neoplastic lesions. While among cancers of female genital tract, the incidence of ovarian cancer ranks below only carcinoma of cervix and endometrium. The aim of this study was to observe and evaluate the frequency and morphological pattern of different ovarian pathologies encountered in this tertiary care centre of rural India.

Methods: This was a retrospective five years observational study (2012-16) and conducted at Department of Pathology of UPUMS, Saifai. The study material included 264 histopathology specimens received in our department.

Results: Total 264 cases of ovarian pathologies were studied, in which 147 cases were non-neoplastic while remaining 117 cases were neoplastic. The most common non-neoplastic lesion was follicular cyst (51.7%), followed by corpus luteal cyst (30.61%), endometriosis (15.64%). Among 117 neoplastic cases, 87 cases (74.35%) were benign, 5 cases (4.27%) were borderline tumours and 25 cases (21.36%) were diagnosed malignant. Serous cystadenoma was most common benign tumour with 53 cases (45.29%) followed by 20 cases (17.09%) of dermoid cyst and 12 cases (10.25%) of mucinous cystadenoma. While in malignant tumours, serous adenocarcinoma were most common (4.27%) followed by mucinous adenocarcinoma (2.56%).

Conclusions: In our study, non-neoplastic ovarian lesions were more commonly seen than neoplastic lesions. Surface epithelial tumours were most common histologic type in all age groups. While serous adenocarcinoma was most common ovarian malignancy seen. Both non-neoplastic as well as neoplastic lesions of ovary often present with similar clinical and radiological features. So histopathological study is essential to diagnose ovarian tumours.

Keywords: Germ cell tumours, Ovarian tumours, Ovarian cyst, Surface epithelial tumours

INTRODUCTION

Most common ovarian lesions include benign non-neoplastic lesions including functional cysts and neoplastic lesions i.e. ovarian tumours. Ovarian lesions affect all age groups. The ovary has three main histologic compartments i.e. the surface mullerian epithelium, the germ cells and the sex-cord stromal cells. Each compartment gives rise to distinct non-neoplastic and neoplastic lesions.[1,2] Some type of non-neoplastic lesions e.g. follicular cysts, are so common that they are considered virtually normal.[1] During the year 2002, ovarian cancer is ranked third in frequency (4.1%) among all cancers in women, with an estimated 2,04,499 new cases occurring worldwide.[3] According to Indian Cancer Registry data project, Ovary is a common site of cancer in women, comprising up to 8.7% of cancers in different parts of India.[4]

Ovarian tumours are difficult to be diagnosed until they are advanced in stage, as clinical features are vague and insidious in onset. The clinical course of different

histologic type of ovarian tumours are much variable.[5,6] Most ovarian cancers detected when they have spread beyond the ovary.[1] So, they have the worst prognosis and highest case fatality rate among all gynaecological malignancies.[7,8] This study has been conducted with the aim to evaluate the frequency and distribution of different types of neoplastic and non-neoplastic lesions of ovary in the population of this rural region.

METHODS

This was a retrospective five years observational study (from 01 January 2012 to 31 December 2016) and conducted at Pathology Department of UP University of Medical Sciences, Saifai, Etawah, Uttar Pradesh, India. This Institute is also the largest health care centre in this rural region. So, our targeted population was mainly comprising of women residing in this region. Institutional ethical committee approved this study. Necessary consent from the patients had been taken.

The Study material included 264 histopathology specimens of ovarian pathologies. Nature of these specimens was either oophorectomy alone or hysterectomy with salpingo-oophorectomy. We included all cases of ovarian pathologies reported during study period i.e. primary ovarian pathology as well as ovarian lesions presented with other pathologies of female genital tract. While hysterectomy specimens devoid of any ovarian pathology were excluded. We also collected detailed clinical and radiological findings of these cases under study, including previous fine needle cytology aspiration (FNAC) report, ultrasonography (USG) or computed tomography (CT) report.

We also evaluated other relevant investigation like serum tumour markers. All the specimens of ovarian pathologies were fixed in 10% neutral buffered formalin. During gross examination, specimens were measured and evaluated for capsule, cut section, cyst content, presence of any calcification or haemorrhage. The specimens were grossed to take representative sections from pathologies. For ovarian tumours, we took one sections for each centimetre of tumour or at least three sections. Tissue processing was done by automated tissue processor, followed by tissue embedding, section cutting and staining with haematoxylin and eosin (H and E). All these steps were done according to standard protocol. Immunohistochemistry (IHC) had been also performed in selected cases. The prepared sections after coverslipping, were examined under the microscope. The histopathological diagnosis was made according to world health organization (WHO) classification.9 After diagnosis, results were noted and compared according to histologic types and subtypes.

RESULTS

Total 264 cases of ovarian pathologies were studied, in which 147 cases were non-neoplastic while remaining 117 cases were neoplastic. The most common non-neoplastic lesion was follicular cyst (51.7%), followed by corpus luteal cyst (30.61%), endometriosis (15.64%). In majority of cases these were the incidental findings (Table 1).

Table 1: Non-neoplastic lesions.

Non-neoplastic lesions	Number of cases	%
Follicular cyst	76	51.70
Corpus luteal cyst	45	30.61
Endometriosis including chocolate cyst	23	15.64
Inclusion cyst	01	0.68
Luteoma of pregnancy	01	0.68
Tuberculosis	01	0.68
Total	147	100

In our study, we found neoplastic lesions of ovary in 117 cases. Among these cases 87 cases (74.35 %) were benign, 5 cases (4.27%) were borderline tumours and 25 cases (21.36 %) were diagnosed malignant. In histologic subtypes, surface epithelial lesions were most common and total 82 cases (70.08%) were found, followed by 26 cases (22.23%) of germ cell tumour, 5 cases (4.27%) of sex cord stromal tumour and 3 cases (2.56%) of metastatic malignancy (Table 2).

Table 2: Neoplastic lesions of ovary (benign, borderline and malignant).

Neoplastic lesions (classes of tumour)	Benign	Borderline	Malignant	Total No. of cases	%
Surface epithelial tumours	65	05	12	82	70.08
Sex cord stromal tumour	02	-	03	05	4.27
Germ cell tumour	20	-	06	26	22.23
Metastatic tumour	-	-	03	03	2.56l
Lymphoma	-	-	01	01	0.85
Total	87	05	25	117	100

Serous cystadenoma were most common benign ovarian tumours, seen in our study and total 53 cases (45.29%) were found, followed by 20 cases (17.09%) of dermoid cyst and 12 cases (10.25%) of mucinous cystadenoma. While in malignant tumours, serous adenocarcinoma was most common with 5 cases (4.27%) followed by

mucinous adenocarcinoma, endometrioid adenocarcinoma and metastatic malignancy with 3 cases (2.56%) of each. (Table 3).

Table 3: Neoplastic lesions of ovary, histologic types.

Neoplastic lesions (Histological Subtype)		Number of cases	%
Surface epithelial tumours		82	70.08
	Serous cystadenoma	53	45.29
	Borderline serous tumours	03	2.56
	Serous adenocarcinoma	05	4.27
	Mucinous Cystadenoma	12	10.25
	Borderline Mucinous tumours	02	1.70
	Mucinous Adenocarcinoma	03	2.56
	Endometrioid Adenocarcinomas	03	2.56
	Clear cell carcinoma	01	0.85
Sex cord stromal tumours		05	4.27
	Granulosa cell tumour	03	2.56
	fibroma	02	1.70
Germ cell tumours		26	22.23
	Mature Teratoma (dermoid cyst)	20	17.09
	Immature Teratoma	02	1.70
	Dysgerminoma	04	3.41
Other	Lymphoma	01	0.85
Metastatic tumours		03	2.56
Total		117	100

Age of the patients ranged from 14 years to 78 years. The most common age group affected was 31-45 years. Benign tumours were most commonly seen in age group of 16-30yrs and 31-45 years, while malignant tumours were most commonly observed in 46-60 years and >60 years group. Only two cases of ovarian tumour seen in up to 15 years age group, and both the case were germ cell tumour (dysgerminoma in our study). Germ cell tumours were most commonly seen in age group of 16-30 years group (12 cases i.e. 46.15%), while surface epithelial tumours were most commonly seen in 31-45 years group (36 cases i.e. 43.90%) (Table 4).

DISCUSSION

Ovarian lesions are the one of the major pathological findings in all gynaecological specimens. Ovary is the common site for neoplastic as well as non-neoplastic lesions. Some type of non-neoplastic lesions e.g. follicular cysts are so common that they are considered virtually normal.[1] Both non-neoplastic as well as neoplastic lesions of ovary often present with similar clinical and radiological features e.g. cystic lesion in ultrasonography. So prophylactic oophorectomies and hysterectomies are performed.[10]

Martinez-Onsurbe P et al, reported 55 cases (41.67%) of non-neoplastic lesions, out of total 132 ovarian lesions and Kreuzer GF et al, reported 82 (40.39%) non-neoplastic lesions, out of 203 ovarian lesions.[11,12] while in this study we found 147 cases (55.68%) of non-neoplastic lesions out of 264 ovarian lesions. Similar larger proportion of non-neoplastic lesions 75 cases (51.72%) out of 145 ovarian lesions, reported by Kanthikar SN et al.[13] The non-neoplastic lesions like follicular cysts and corpus luteum cysts are seen very commonly in hysterectomy with oophorectomy specimens.[14]
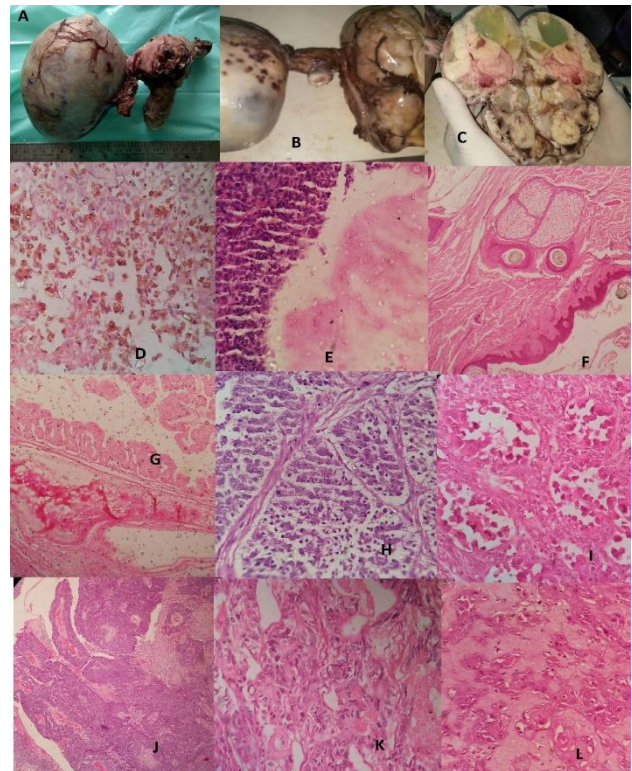

Figure 1: (A) Gross specimen of hysterectomy and bilateral oophorectomy with right serous cystadenoma. (B) Gross specimen of bilateral ovarian tumour. (C) Cut section of mucinous cystadenocarcinoma. (D) Microscopic picture of ovarian endometriosis (400x). (E) Follicular cyst (400x) (G) Dermoid cyst (100x). (G) Borderline mucinous tumour (100x). (H) Dysgerminoma (400x). (I) Clear cell tumour (400x). (J) Serous papillary adenocarcinoma (100x). (K) Serous adenocarcinoma (400x). (L) Metastatic carcinoma (400x).

In present study, out of total 147 non-neoplastic cases, follicular cyst was most common lesions with 76 cases (51.7%), followed by 45 cases (30.61%) of corpus luteum cyst, 23 cases (15.64%) of endometriosis including chocolate cyst, 1 case (0.68%) of inclusion cyst, luteoma and tuberculosis each. Nearly similar results were reported by Martinez-Onsurbe P et al and Kreuzer GF et al with 55% follicular cysts.[11,12] Gupta N et al, reported follicular cysts and corpus luteal cysts 80.2%, while in our study it was similar as 121 cases (82.31%).[15]

Table 4: Frequency of different classes of ovarian tumours in different age group.

Age group in years	Surface epithelial tumours	Germ cell tumours	Sex cord stromal tumours	Metastatic tumours	Other (Lymphoma in this study)	Total
Up to 15 years		2				2
16-30 years	23	12	1			34
31-45 years	36	10	1			49
46-60 years	12	1	2	1	1	17
>60 years	11	1	1	2		15
Total	82	26	5	3	1	117

Table 5: comparative incidence of ovarian tumours (in %) in other studies.

Ovarian tumours	Kanthikar SN et al[13]	Gupta et al[15]	Bhuvanesh et al[23]	Pilli et al[24]	Patil RK et al[25]	Present study
Surface epithelial tumour	67.14	65.6	78.57	70.9	72.2	70.08
Germ cell tumours	22.85	23.9	10.85	21.2	19.9	22.23
Sex cord stromal tumours	5.71	8.3	7.14	6.7	6.6	4.27
Metastatic tumours	4.28	2.0	1.42	0.7	1.3	2.56

Endometriosis is common in reproductive age group and the most common locations are ovary, uterine ligaments, rectovaginal septum and cul-de-sac. In our study we reported total 23 cases (15.64%) as endometriosis out of 147 non-neoplastic cases. Carey M et al, and Clement PB et al.[16,17] Reported fewer percentage of endometriosis while Al-Fozan H et al, reported much larger percentage (45.59%) of ovarian endometriosis among all non-neoplastic lesions of ovary.[18]

In this study we reported 117 neoplastic lesions of ovary. Ovarian neoplasm usually does not manifest clinically in early stage and nearly 60-70% cases present in advanced stage i.e. spread beyond the ovary.[19]

Ovarian tumours may occur at any age group. In this study, the youngest patient was of 14 years and oldest of 78 years. Among all 117 neoplastic cases of this study, 87 cases (74.35 %) were benign, 5 cases (4.27%) were borderline tumours and 25 cases (21.36 %) were diagnosed malignant (Table 2). While Modi D et al, reported 84.5% benign, 2.1% borderline and 13.4% ovarian tumours as malignant in their study.[20] Benign tumours were reported 51% and 59.18% in similar studies on ovarian tumours done by Nishal et al, and Ahmad et al, respectively.[5,21] In comparison with 4.27% cases of borderline tumours in our study, Nishal et al, and Mondal et al, found 5% and 7.3% cases of borderline tumours in their studies on ovarian neoplasms.[5,22]

In this study, among all main histological classes of ovarian tumours, surface epithelial tumours were the commonest with 82 cases (70.08%), followed by 26 cases of (22.23%) germ cell tumours, 5 cases (4.27%) of sex cord stromal tumour, 3 cases (2.56%) of metastatic tumour and 1 case (0.85%) of ovarian lymphoma. (Table 3) Similar observations were observed in other studies.[13,15,23-25] (Table 5).

Among the surface epithelial tumours, Serous cystadenoma was commonest type found in our study with 53 cases (i.e. 45.29% of all tumours). Similar results were seen in other studies.[19,20,26]

In the present study, we diagnosed 5 ovarian tumours (4.27%) as borderline. In which, 3 cases were diagnosed as borderline serous tumours while remaining two as borderline mucinous tumours. Nishal et al, found similar results as 5% cases of borderline tumours, while Mondal et al found 7.3% cases, and Patil RK reported only 0.7% cases of borderline tumours.[5,22,25]

In this study, we found 25 cases (21.36%) of malignant ovarian tumours, including 12 cases of malignant surface epithelial tumours, 6 cases of germ cell tumours, 3 cases of sex cord stromal tumour and metastatic tumours each. While one case was diagnosed as malignant lymphoma. Serous adenocarcinoma was most common malignant surface epithelial tumour in our study (5 cases) followed by mucinous adenocarcinoma and endometrioid carcinoma with 3 cases of each. These observations in this study are consistent with other similar studies. However, Sharma et al, reported mucinous cystadenocarcinoma as most common malignant ovarian tumour in their study.[2]

CONCLUSION

In our study non-neoplastic ovarian lesions were more commonly seen than neoplastic lesions. In neoplastic

lesions, benign tumours were more common than malignant. Surface epithelial tumours were most common histologic type in all age groups. while serous adenocarcinoma was most common ovarian malignancy seen. Ovarian malignancies behave like "Silent Killer" as they present in advanced stage. Both non-neoplastic as well as neoplastic lesions of ovary often present with similar clinical and radiological features. So histopathological study is essential to diagnose ovarian tumours and predict their prognosis.

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