Clinico-Histopathological Analysis of Neoplastic and Non-Neoplastic Lesions of the Ovary: A 3-Year Prospective Study in Dhule, North Maharashtra, India

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ABSTRACT

Background: Ovary is the commonest site of neoplastic and non-neoplastic lesion, can present in childhood to postmenopausal age group and accounts for the most prevalent cause of hospital admissions.

Aim: This study was done to analyse the frequency of ovarian lesions their clinico-histological features in a rural set up.

Materials and Methods: This is a prospective study of 145 ovarian lesions at tertiary care hospital over a period of 3yr. All the relevant clinical data of patients analysed from hospital record file.

Results: The total number of ovarian lesions studied during study period was 145 cases, amongst them 75 were non-neoplastic and remaining 70 were neoplastic. The most common non-neoplastic lesion seen was solitary follicular cysts i.e. 56 cases (74.66%), followed by corpus luteal cysts 15 cases (20%). Among the 70 neoplastic ovarian lesions 55(78.57%) cases were benign, 1(1.42%) case was at borderline and 14 (20%) cases were malignant. In benign ovarian neoplasm, most commonly seen lesion were serous cystadenoma followed by benign cystic teratoma. In malignant cases, maximum were of serous cystadenocarcinoma, followed by mucinous cystadenocarcinoma and metastatic tumours.

Conclusion: Ovarian lesion possess wide gamut of histology. Specific diagnoses are made on routine gross and histological examination or in certain difficult cases require immunohistochemistry.

INTRODUCTION

Ovary is an important organ as it is concerned with the production of progeny. The ovary consists of sex cells and mesenchymal cells which are totipotential and multipotential respectively. So when it becomes neoplastic, almost any types of tumour can result [1].

Ovarian tumour and non-neoplastic lesions present a great challenge to gynecological oncologist. Certain non-neoplastic lesions of the ovary frequently form a pelvic mass and potentially mimic an ovarian neoplasm. Their proper recognition and classification is therefore important to allow appropriate therapy [2].

It is a well-established fact that neoplastic conditions of ovaries form a complicating and baffling subject in the history of oncology. The neoplasm arising from it inherits a spectrum of histogenetic background, much more varied than any other [3].

Ovarian cancer is the seventh leading cause of cancer death (age standardized mortality rate: 4/100,000) among women worldwide and in India it's comprising up to 8.7% of cancers in different parts of the country [4-5].

Variable histopathological presentations of ovarian tumours lead to detection in advanced stage where neither effective surgery nor chemotherapy can be done [6-7].

Peak incidence of invasive epithelial ovarian cancer is at 50-60yr of age. About 30% of ovarian neoplasms in postmenopausal women are malignant, whereas only about 7% of ovarian epithelial tumours in the premenopausal patient are frankly malignant [8]. Prognosis of ovarian tumours in women under 40yr of age have greater a chance of recovery than older patient [9].

Early diagnosis is difficult due to its asymptomatic nature, inaccessible site and the limited use of various new techniques like cytology and biopsy. Thus, ovarian neoplasm offers a good field for research [10].

MATERIALS AND METHODS

A prospective clinico-pathological study of 145 cases of non-neoplastic and neoplastic lesions of ovary was conducted in Department of Pathology over the period of three years. The materials for this study, ovarian specimen was obtained from hysterectomy specimen with unilateral or bilateral adnexa, and oophorectomy and/or cystectomy specimens received in the department.

Relevant clinical information regarding the age, clinical features, radiological findings and provisional diagnosis were obtained. The specimens were analysed in detail macroscopically for various parameters like size, external surface, and consistency and cut sections with contents of cyst.

The tissues were processed by routine paraffin techniques and sections stained with Haematoxylin and Eosin were taken for microscopic examination.

The non-neoplastic and neoplastic lesions from representative sections were studied and classified according to World Health Organisation (WHO) classification 2002 and staging is done according to International Federation of Gynaecology and Obstetrics (FIGO) staging.

RESULTS

Amongst 145 cases studied during study period, 75 were non-neoplastic and remaining 70 were neoplastic.

Most of the non-neoplastic 41 (55%) lesions of ovary were incidental findings. The most common non-neoplastic lesion found was solitary follicular cysts followed by corpus luteal cysts [Table/Fig-1].

Non-neoplastic lesions of ovary	Number of cases	Percentage
Follicular cyst	56	74.6%
Corpus luteal cyst	15	20.00 %
Inclusion cyst	02	2.67%
Endometriosis	02	2.67%
Total	75	100%
Mean	28.04	31.52

[Table/Fig-1]: Showing frequency of non-neoplastic lesions of ovary in the present study

Clinical symptoms	No. of cases	Percentage
Pain in abdomen	22	29.33%
Menstrual irregularities/abnormal vaginal bleeding	27	36.00%
Pain in abdomen with white discharge per vagina.	9	12.00%
Pain in abdomen with mass per abdomen	6	8.00%
Mass per abdomen only.	8	10.67%
Pain in abdomen with Menstrual irregularities/ abnormal vaginal bleeding	3	4.00%
Total	75	100%

[Table/Fig-2]: Showing the clinical symptoms of 75 cases of non-neoplastic lesions of ovary in the present study

Nature of tumours	Number of cases
I. Epithelial stromal tumours	
A. Serous tumours	
1. Serous cystadenoma	25 (35.71)
2. Serous papillary cystadenoma	3 (4.28)
3. Borderline serous tumour	1 (1.42%)
4. Serous cystadenocarcinoma	6 (8.57%)
B. Mucinous tumours	
1. Mucinous cystadenoma	7 (10%)
2. Mucinous papillary cystadenoma	1 (1.42%)
3. Mucinous cystadenocarcinoma	3 (4.28%)
C. Endometrioid tumour-Adenocarcinoma type	1 (1.42%)
II. Germ cell tumours	
1. Benign cystic teratoma	13 (18.57%)
2. Dysgerminoma	2 (2.85%)
3. Struma ovarii	1 (1.42%)
III. Sex cord stromal tumours	
1. Granulosa cell tumour	1 (1.42%)
2. Fibroma	3 (4.28%)
IV. Metastatic	
1. Metastatic tumour.	3 (4.28%)
Total	70 (100%)

[Table/Fig-3]: Showing frequency of ovarian neoplasm in the present study

In current study most of the patients of non-neoplastic lesions presented with more than one symptom [Table/Fig-2].

Among the 70 neoplastic ovarian lesions 55(78.57%) cases were benign, 1(1.42%) case was at borderline and 14 (20%) cases were malignant [Table/Fig-3].

In 55 benign ovarian neoplasms, most common seen lesion was serous cystadenoma followed by benign cystic teratoma and mucinous cystadenoma. Out of total 14 malignant cases, maximum 6 were of serous cystadenocarcinoma followed by 3 cases of mucinous cystadenocarcinoma and 3 cases of metastatic tumours.

Marital status and parity	Type of tumour		Total
	Benign	Malignant	
Unmarried	5(9.09%)	--	5(7.14%)
Nulliparous	8 (14.54%)	6(33.33%)	14(20%)
Parity 1	3 (5.45%)	3(20%)	6 (8.57%)
Parity 2	17 (30.90%)	2(13.33%)	19(27.14%)
Parity 3	10(18.18%)	2(13.33%)	12(17.14%)
Parity 4	6 (10.90%)	2(13.33%)	7 (10%)
Parity 5 and above	6 (10.90%)	1 (6.66%)	7 (10%)
Total	55	15	70

[Table/Fig-4]: Showing incidence of marital status and parity distribution in the present study

Most of the benign tumour were observed in the age group of 20-40yr, while most of the malignant tumours cases were common in elderly (>40 years) age group.

Present study comprised of 55 cases of neoplastic lesions of ovary. In which 12 patients had bilateral ovarian tumours, while majority were unilateral.

On gross examination 44.78% cases were cystic, 22.39% were solid and 32.83% cases were partly solid and partly cystic.

The most consistent prevention factor for ovarian cancer are bearing children and using oral contraceptives [11]. Incidence of malignancy is inversely proportional to parity. In the present study, it was observed that malignant tumour were common in nulliparous women (33.33%) [Table/Fig-4].

DISCUSSION

Ovarian cancer is the second leading cause of mortality among all gynecological cancers [11]. Due to similar clinical presentations there is confusion in the diagnosis of non-neoplastic and neoplastic lesions of ovary although it is diagnosed as a mass or cystic lesion on ultrasonography and hence removed prophylactically in routine oophorectomies and hysterectomies [12].

In current study 145 ovarian lesions of non-neoplastic and neoplastic origins were evaluated to find out incidence, histogenesis, clinical and pathological features.

Kreuzer GF et al., [13] reported 82 (40.39%) non-neoplastic lesions out of 203 ovarian lesions and Martinez-Onsurbe P et al., [14] reported 55 (41.67%) non-neoplastic lesions out of 132 ovarian lesions. Incidence reported in our study regarding non-neoplastic lesions was higher and concurring with the above studies.

The non-neoplastic lesions like follicular or corpus luteum cysts are the commonly encountered conditions [15]. In current study 73 cystic lesions were reported out of which follicular 56 (76.71%), corpus luteum 15 (20.54%) and 2 inclusion cyst. Incidence of these cysts were accordance with to Kreuzer GF et al., [13] (55% Follicular cyst and 45% corpus luteal cyst) and Martinez-Onsurbe P et al., [14] (55% follicular cyst and 45% corpus luteal cyst). Gupta N et al., [2] reported follicular and corpus luteal cyst (80.2%). In the present study the incidence was 97.26%, which was higher than this study.

Endometriosis is common condition found in women of reproductive age. The most common location of endometriosis is the ovary and posterior cul-de- sac [16]. In our study two cases (2.67%) were reported. These findings were similar to Gupta N et al., [2] (2.9%), Carey M et al., [17] and Clement PB et al., [18]. Al Fozen H and Tulandi T [16] in a study conducted for 6 year reported 340 lesions out of which 155 (45.59%) were ovarian endometriosis.

In clinically suspected ovarian pathology cases, the most common clinical symptoms were menstrual irregularities/ abnormal vaginal

bleeding in 27 cases (36%), pain in abdomen in 22 cases (29.33%) and abdominal pain with mass per abdomen in 6 cases (8%). These findings were similar to Winter Jo TV et al., [19] study.

In the present study, 70 neoplastic lesions were diagnosed most common was benign followed by, borderline malignancy and malignant tumour [Table/Fig-5].

Ovarian tumour may occur at any age, including infancy and childhood. Incidence rate, however increase with age, with the greatest number of new cases being diagnosed beyond 4th and 5th decade. In our study, the youngest patient was of 9yr and oldest of 70yr, which was concordance with Couto F et al., [20].

Based on histomorphological features, incidence of surface epithelial tumours were commonest (67.14%) followed by germ cell tumours (22.85%), sex cord (5.71%) and metastatic (4.28%). Similar observations were seen in other studies [Table/Fig-6] [2,10,20,21].

Type of tumour	Gupt et al.,[2]	Pilli et al.,[21]	Saxena et al.,[7]	Couto F et al.,[20]	Present study
Benign	72.9%	75.2%	76.4%		78.57%
Borderline	4.1%	2.8%	-	2.33	1.42%
Malignant	22.9	21.8%	23.6%	-	20%

[Table/Fig-5]: Comparison of frequency of ovarian tumours with other workers

Ovarian tumours	Couto F et all.,[20]	Pilli et all.,[21]	Gupta et all.,[2]	Bhuvanesh et al.,[10]	Present Study
Surface Epithelial tumour	68.81	70.9	65.6	78.57	67.14
Germ cell tumour	20.39	21.2	23.9	10.85	22.85
Sex cord stroma tumour	--	6.7	8.3	7.14	5.71
Metastatic tumours	1.46	0.7	2.0	1.42	4.28

[Table/Fig-6]: Comparative incidence of overall (benign and malignant) Ovarian tumours

Our study reveals that the presentation of ovarian tumours was variable. Some of the ovarian tumours were incidentally diagnosed on ultrasound whereas others may be symptomatic like lump/ pain in abdomen. In our study the commonest presenting symptom was lump in abdomen followed by pain in abdomen which was in accordance with previous studies [Table/Fig-7] [10, 22-24].

In Benign and malignant ovarian neoplasm, lump in abdomen was the most common complaint, followed pain in abdomen, gastrointestinal disturbances with loss of weigh and appetite ascites. These findings were in accordance with other studies [Table/Fig-7] [10,22-24].

There is inverse relation between ovarian cancer risk and parity. Parous women are at significantly lower risk than nulliparous women. In our study, incidence of nulliparity (20%) is comparable with Misra et al., (16.00%) and Madan et al., (14.54%) [3,25,26].

In our study, 78.18% tumours were unilateral and 21.82% tumours were bilateral. The incidence of laterality was in concordance with Bhuvanesh et al., [10] (25.75%), while Madan et al., [25] and Verma et al., [27] reported a low incidence of 11% and 11.91% respectively. We found incidence of unilateral tumour comparatively higher than these studies.

Grossly, it was found in our study that benign tumours were cystic as compared to malignant, which were solid in consistency followed by partly cystic and partly solid which were mostly in malignant tumour which is in accordance with other studies [Table/Fig-8] [2,3, 25,28].

Ovarian cancers are called as "silent killer" as in most of the primary ovarian tumour they remain asymptomatic until the advanced stage [8]. However, histomorphological study of tumour is still today a gold standard method, these observations and results proved to be valuable base line information regarding frequency and pattern of ovarian tumours in rural settings like our Dhule district North Maharashtra, India.

CONCLUSION

To conclude, number of various clinical parameters such as age of the patient, presenting complaints, location of lump, dimensions of lump, on one hand and histological type of ovarian neoplasm on the other hand are all interrelated. All these clinical and histomorphological parameters and advanced newer diagnostic modalities like immunohistochemistry, morphometric analysis can help to early diagnosis and to plan the line of treatment and also have prognostic significance.

Because of the geographic location, poverty and illiteracy, patients seek medical advice late in rural health facility. So, awareness among public and doctors, educating people, passive surveillance, and community screening facility will be helpful in early detection of the ovarian lesions and tumours.

Clinical presntation	Benign				Malignant			
	Jagdeshwari et al., [23]	Bhuvanesh et al., [10]	Kuladeepa A et al., [22]	Present study	Goff BA et al., [24]	Bhuvanesh et al., [10]	Kuladeepa A et al., [22]	Present study
Lump in abdomen	50.8	51.9	67.16	50.90	43.0	61.1	78.95	66.66
Pain in abdomen	-	-	63.4	45.45	22.0	50.0	68.42	53.33
GIT complaints	9.4	9.6	11.94	10.90	24.0	-	42.11	13.33
Loss of weight/ appetite	-	3.8	4.47	5.45	34.0	38.9	31.58	20.0
Ascites	-	1.9	4.47	-	27.0	44.4	31.58	13.33

[Table/Fig-7]: Comparisons of clinical presentation/ presenting symptoms with various studies

Clinical presntation	Benign			Borderline			Malignant		
	Cystic	Solid	Partly cystic and solid	Cystic	Solid	Partly cystic and solid	Cystic	Solid	Partly cystic and solid
Gupta et al., [2]	76.2	2.4	21.5	-	-	-	6.7	49.2	44.1
Madan et al., [25]	87.22	2.33	10.45	-	-	-	-	52.94	41.38
Mishra et al., [3]	95.4	1.08	3.51	-	-	40	10.63	15.95	73.40
Prabhakar et al., [28]	88.5	7.45	4.2	60	-	40	0.94	18.9	71.14
Present study	66.67	13.3	28.88	-	-	1.42	-	42.85	55.0

[Table/Fig-8]: Consistency of ovarian tumours

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