



HISTOMORPHOLOGICAL STRATIFICATION OF OVARIAN PATHOLOGY

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ABSTRACT **Background:** Ovary is the commonest site of neoplastic and non-neoplastic lesion, can present in childhood to the postmenopausal age group and accounts for the most prevalent cause of hospital admission. Histopathological examination remains the gold standard investigation for the study of these lesions.

Aim: To study the frequency of neoplastic and non-neoplastic lesions and to evaluate the histomorphological patterns and highlight the rare types and rare features in the usual type if any.

Material and methods: The present prospective study is based on the histomorphological evaluation of 60 cases of ovarian lesions received at the department of pathology over a period of one year from 1st June 2017 to 31st may 2018. Histopathological patterns were identified and categorized into non-neoplastic and neoplastic entities.

Result: The non-neoplastic and neoplastic category had 35 and 25 cases each accounting for 58% and 42% respectively. The commonest non-neoplastic lesion was a corpus luteal cyst, 16 cases constituting 45.7%, the follicular cyst was the second most common with 8 cases, 23%. Endometriotic and Hemorrhagic ovarian cyst with 5 cases each constituted for 28% of the non-neoplastic lesions. The commonest ovarian tumour was surface epithelial with 21 cases, 84%, serous cystadenoma was the most common surface epithelial tumour followed closely by mucinous cystadenoma (serous cystadenoma 8 Cases/32%, mucinous cystadenoma 7 Cases/ 28%). Germ cells and the sex-cord stromal tumor had a contribution of 2 cases each, 16%. **Conclusion:** Ovarian lesion possesses a wide gamut of histology, the non-neoplastic category is the most common than neoplastic category. Corpus luteal cysts and follicular cysts are frequently encountered non-neoplastic lesions when compared to endometriotic and hemorrhagic ovarian cysts which were less common. Serous and mucinous cystadenoma were the common entities encountered in the neoplastic category. Histopathology remains the gold standard investigatory tool for evaluation of these entities.

CONCLUSION : Non-neoplastic category of ovarian lesions are the commonest followed by neoplastic ones, the corpus luteal and the follicular cysts contributed to the majority of the cases in the non-neoplastic category with a minor contribution by endometriotic and HOC. The benign serous cystadenoma was the commonest of the ovarian neoplasm followed closely by mucinous cystadenoma together contributing to the major bulk in this category. The diverse clinical presentation justifies the need for histopathological examination and diagnosis of the lesion, an accurate histopathological diagnosis will help in rendering prompt and appropriate treatment to the patient.

KEYWORDS : Histopathological, Ovarian lesions, Neoplastic , Nonneoplastic

INTRODUCTION:

Ovary an important organ concerned with the production of progeny are ovoid, approximately 3–5x1.5x 0.6cm, and weigh 5–8 g1 with a pink-white smooth exterior in early reproductive life which convolutes thereafter. The outer cortex, an inner medulla, and the hilus are the zones discernible on the sectioned surface, follicular structures (cystic follicles, corpora lutea, and corpora albicantia) are usually visible in the cortex and medulla²

Ovary gives rise to a vast array of pathologic entities ranging from innocuous non-neoplastic to obnoxious neoplastic ones. No age group is exempt from the ovarian lesions. The non-neoplastic pathologies are quite frequent as opposed to the neoplastic entities, non-neoplastic lesions usually encountered are the follicular and corpus luteal cysts followed by endometriotic and hemorrhagic ovarian cysts. Ovarian tumors arise from surface epithelium, germ cells or sex cord-stromal elements, surface epithelial tumors are the most common comprising for about 58% of all ovarian tumor, germ cells and sex cord-stromal tumors account for 32% and 9% of ovarian tumors respectively⁴.

The Histopathological examination plays a key role in the diagnosis of ovarian lesions even though the advent of imaging techniques like USG and CT scan has made it possible for cytology to play a significant role in diagnosis and management⁵. Cystic lesions of the ovary are often functional and less frequently neoplastic and these can be distinguished by hormone assay. The laparoscopic aspiration of the cyst in conjunction with ultrasound findings(size, multiloculation & solid areas) and hormonal assay will obviate unnecessary surgery. FNB has a high diagnostic accuracy of 90-95% for ovarian tumors but lacks specificity in stromal and uncommon tumors, cystic tumors have a low accuracy. Rare studies have indicated a high proportion of unsatisfactory samples, a low diagnostic sensitivity and high specificity for cystic lesions³ Histopathology the ultimate decisive investigatory tool either confirms or refutes the diagnosis offered by cytological and imaging techniques.

The aim of this study was to analyze the frequency of patterns in ovarian pathology with an objective to highlight the special features in rare types and rare features in usual type if any.

MATERIAL AND METHODS:

A prospective study involving 60 cases was conducted in the department of pathology at KVG medical college sullia from June 1st 2017 to 31st may 2018 during a tenure of 1 year which included ovarian pathologies of all categories. Those who underwent oophorectomy or hysterectomy with confirmed histopathological changes were included in the present study. Clinical details of the patients were assessed in conjunction with sonological and hormonal profiles. Gross examination was carried out and salient features were recorded. Multiple sections were taken from the surgical specimens fixed in 10 percent formalin, sections were stained with conventional Haematoxylin and Eosin (H&E) stain and subjected for microscopic examination. Special stains were considered wherever needed. The ovarian pathology was classified in accordance with the WHO classification

RESULTS:

The present study was done from June 1st 2017 to 31st may 2018. A total number of 60 cases were studied. Of these 25 cases were neoplastic lesions and 35 were non-neoplastic entities. The histomorphological pattern of non-neoplastic and neoplastic lesions in decreasing order of frequency (Table 1&2) A wide range of age distribution was noted among neoplastic and non-neoplastic lesions (Table 3&4). The youngest patient was 11 years whereas the oldest was 73 years in our study. Majority of the cases in both categories were seen in the age group of 31-40 years (26 cases), accounting for 34.3 % in the non-neoplastic category and 56 % in the neoplastic category. In the current study most of the patients in both the categories presented with more than one symptom (Table 5&6). Benign serous cystadenoma constituted for 32% (8 Cases) of all ovarian neoplasm. Mucinous cystadenoma was the second most common tumor. In the non-neoplastic category, Corpus luteal cysts formed the largest group (45.7%); followed by follicular cysts (33.3%)

Table 1 : Histological Type Of Non-neoplastic Lesions

Non - Neoplastic Lesion	Number Of Cases	Percentage
Corpus Leuteal Cysts	16	45.70%
Follicular Cysts	8	23%

Endometriotic Cyst	5	14.20%
Hemorrhagic Cyst	5	14.20%
Inclusion Cyst	1	2.90%
TOTAL	35	100

Table 2 : Histological Type Of Neoplastic Lesions

Histological Type Of Neoplastic Lesion	Number	Percentage
Benign Serous Cystadenoma	8	32%
Serous Cystadenocarcinoma	1	4%

Papillary Cystadenocarcinoma	3	12%
Benign Mucinous Cystadenoma	7	28%
Borderline Mucinous Cystadenoma	2	8%
Teratoma	1	4%
Malignant Mixed Germ Cell Tumor	1	4%
Granulosa Cell Tumor	1	4%
Ovarian Fibroma	1	4%
Total	25	

TABLE 3 : AGE DISTRIBUTION IN NON- NEOPLASTIC LESIONS

Age	Follicular Cyst	Corpus Luteal Cyst	Hemorrhagic Cyst	Endometriotic Cyst	Inclusion Cyst	Percentage
0-10 YEAR	X	X	X	X	X	X
11-20 YEAR	1	2	1	X	X	11.40%
21-30 year	X	2	1	2	1	17%
31-40 YEAR	2	6	1	3	X	34.30%
41-50YEAR	4	3	X	X	X	20.00%
51-60 YEAR	1	3	1	X	X	14.30%
> 60 YEAR	X	X	1	X	X	3.00%

TABLE 4 : AGE DISTRIBUTION IN NEOPLASTIC LESIONS

AGE	Benign Serous Cystadenoma	Serous Cystadenocarcinoma	Papillary Serous Cystadenocarcinoma	Benign Mucinous Cystadenoma	Borderline Mucinous	Mucinous Cystadenocarcinoma	Teratoma	Mixed Germ Cell Tumor	Ovarian Fibroma	Granulosa Cell Tumor	%
0-10 YEAR	X	X	X	X	X	X	X	X	X	X	0%
11-20 YEAR	1	X	X	X	X	X	X	X	X	X	4%
21-30 YEAR	X	X	1	1	1	X	X	X		X	12%
31-40 YEAR	6	X	X	4	1	X	1	1	1	X	56%
41-50 YEAR	X	X	1	X	X	X	X	X	X	1	8%
51-60	X	1	1	2	X	X	X	X	X	X	16%
>60	1	X	X	X	X	X	X	X	X	X	4%

TABLE 5 : CLINICAL SYMPTOMS OF NON NEOPLASTIC OVARY

Clinical Symptoms	Number Of Cases	Percentage
Abdominal Pain	11	31.20%
Menstrual Irregularities /Abnormal Vaginal Bleeding	19	54.20%
Abdominal Pain With Mass Per Abdomen	3	9%
Abdominal Pain With White Discharge Per Vagina	1	2.80%
Mass Per Vagina	1	2.80%

Table 6 : Clinical Symptoms Of Neoplastic Lesions

Clinical Symptoms	Benign Neoplastic		Borderline Neoplastic		Malignant Neoplastic	
	CASES	%	CASES	%	CASES	%
Abdominal Mass & Irregular Menses	11	64.80%	2	100%	4	66.7%
Abdominal Pain & Irregular Menses	5	29.40%	X	X	X	0%
Abdominal Pain ,Weight Loss	X	X	X	X	2	33.3%
Ascites	1	5.80%	X	X	X	0%
	17	100%	2	X	6	100%

Table 7 : Frequency Of Benign, Borderline And Malignant Tumors present Study

Type of Tumour	Pilli et al.	Gupta et al	Present study
Benign Tumors	75%	72.9%	68%
Borderline Tumors	2.8%	4%	8%
Malignant Tumors	21%	22%	24%

Table 8 : Frequency Of Benign, Borderline And Malignant Tumors

Ovarian Tumours	Pilli et al.	Bhuvnesh et al	Present study
Surface Epithelial Tumor	79%	78.5	84%
Germ Cell Tumour	9%	10.8%	08%
Sex Cord Stroma Tumour	12%	8.3%	08%

DISCUSSION:

Ovarian pathology range from innocuous nonneoplastic lesions to malignant neoplastic entities. The clinically diagnosed entities are subjected to a battery of investigation including radiological, cytological prior to surgery and to Histopathological examination after surgical resection. The present study revealed a majority of them to be non-neoplastic accounting for 58.3%(35 cases), neoplastic entities

constituted 41.7%/25cases. The incidence reported in our study regarding non-neoplastic lesions was higher(58.3%) and concordant with the following authors. Kreuzer GF et al⁶ reported 82 (40.39%) non-neoplastic entities out of 203 ovarian lesions and Martinez-Onsurbe P et al⁷ reported 55 (41.67%) non-neoplastic entities out of 132 ovarian lesions. Non-neoplastic lesions were most commonly seen in 31-40 years of age group accounting 34.3% of total occurrence followed by 41-50 years of age group accounting 20 % of total occurrence(Table 3) which was in concordance with Couto F et al and Pilli et al⁸ study. Most of the patients presented with symptoms of menstrual irregularities/abnormal vaginal bleeding, 54.2% followed by pain abdomen, 31.2%. The scrutiny of 145 cases by Kanthikar et al⁹ noticed menstrual irregularities and pain abdomen to be the most common clinical features accounting for 36.5% and 29.3% which were similar to our study in terms of frequency(Table 5).

The follicular cyst and corpus luteal cyst were the most commonly encountered entities in the non-neoplastic category, they accounted for 45.7% and 23% respectively(Table 1). The incidence of these cysts was in accordance with that of Kreuzer et al¹⁰, 50% corpus luteal cyst and 30% follicular cyst. Follicle cysts (FCs) and corpus luteum cysts

(CLCs) were thin-walled and unilocular ranging from 3 to 8 cm in diameter. Corpus luteal cysts were characterized by the presence of a convoluted yellow lining, most of them exuded serous/serosanguineous fluid, some had clotted blood. The follicular cyst was lined by an inner granulosa cell layer and an outer stratum of theca interna cells. Corpus luteal cyst with its convoluted lining revealed large luteinized granulosa cells and an outer layer of smaller luteinized theca interna cells as described in the literature.

Endometriotic and Hemorrhagic ovarian cyst accounted for 28.4% of nonneoplastic lesions with an equal share of 5 cases each (14.2%) each of the nonneoplastic category (Table 1). The Endometriotic cysts had inspissated, chocolate-colored substance, some of them contained altered semi-fluid material. Histology revealed bland looking endometrial glands and stroma amidst the ovarian substance with plenty of hemosiderin-laden macrophages as quoted by numerous studies [1]. Hemorrhagic cysts were solitary with variation in their size, had red-brown clotted material as its content with yellow lining in the periphery. The cysts had lining epithelium similar to that of corpus luteal cysts with an adjacent hemorrhagic region. The small inclusion cyst with simple flattened epithelium contributed for a meager 2.9% of nonneoplastic cases [2].

The neoplastic category constituted for 41.7% of ovarian lesions. The surface epithelial tumors constituted the majority with 21 cases (84%), germ cell and sex cord stromal tumors accounted for the rest with 2 cases in each category (16%). Similar were the observations made in Pillai et al and Bhuvanesh et al [3] studies (Table 8). Out of 25 neoplastic lesions diagnosed, most of them were benign (17 cases, 68%) followed by borderline malignancy (2 cases, 8%) and malignant tumor (6 cases, 24%). Similar findings with more proportion of benign tumors compared to malignant tumors were reported by Couto et al [4] and Pilli et al [5] (Table 7).

An ovarian tumor may occur at any age, including infancy and childhood. In our study, the youngest patient was of 9yr and oldest of 70yr, a majority of the cases were encountered in the age group of 31-40 years accounting for 56% of total occurrence (Table 4). The age group of 21-40 years saw 68%, 17 cases followed by 40-59 years group constituting 24%, 6 cases. The studies Couto F et al [4] and Pilli et al found the highest incidence of tumors in the age group of 20-39 years, 50.6% followed by 40-59 years, 37.6%. The occurrence of neoplasms was relatively more common in the younger ages in our series.

The presentations of the ovarian tumors were variable, most of them presented as mass per abdomen, 17 cases/68% followed by pain abdomen, 5 cases/20%. Both the above-mentioned presentations were associated with irregular menstrual cycles. The third common clinical presentation was pain abdomen with weight loss, 2 cases, 8%. Mass per abdomen and pain abdomen were common in the benign tumors while pain abdomen with weight loss was a manifestation of the malignant ovarian tumor (Table 6).

The commonest of the ovarian tumor was benign serous cystadenoma constituting for 32% (8 cases) of all ovarian neoplasm, mucinous cystadenoma was the second most common in the series with 28%/7 cases. Among malignant tumors Papillary serous cystadenocarcinoma (12%) was the commonest, rest of the tumors and their incidence were quite low (Table 2). The serous tumors had a smooth and glistening exterior, they were unilocular, with clear fluid, the inner aspect was smooth in case of benign tumors, the malignant cases had a solid papillary growth at the interior. The lining was low columnar with a bland ovoid basal nucleus in benign, the malignant tumors had papillary growth lined by stratified low columnar cells with diffuse areas of infiltration into the fibrotic stroma [6]. The mucinous cystadenoma with a multiloculated mucin filled interior revealed a single layer of columnar mucinous cells. Sex Cord-Stromal tumor in the present study had two cases, single case of granulosa cell tumor and a fibroma, the low incidence when compared to studies by Gupta N et al [7], Misra RK, Prabhakar BR et al [8] may be because of low sample size. Granulosa cell tumor with a solid-cystic appearance on gross examination revealed granulosa cells with varied patterns. The two cases of germ cell tumors encountered had a solid-cystic appearance with all the components of the germ cell layers on microscopy.

CONCLUSION :-

Non-neoplastic category of ovarian lesions are the commonest followed by neoplastic ones, the corpus luteal and the follicular cysts contributed to the majority of the cases in the non-neoplastic category

with a minor contribution by endometriotic and HOC. The benign serous cystadenoma was the commonest of the ovarian neoplasm followed closely by mucinous cystadenoma together contributing to the major bulk in this category. The diverse clinical presentation justifies the need for histopathological examination and diagnosis of the lesion, an accurate histopathological diagnosis will help in rendering prompt and appropriate treatment to the patient.

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