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Histopathological study of ovarian tumors in a tertiary care center

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Introduction: Ovary is a complex structure and its neoplasms show a wide spectrum of histological types and clinical behavior. The present study was done with the aim of studying the histopathological pattern of ovarian tumors in women of various age groups. Ovarian tumors represent about 30% of all cancers of the female genital system. Ovarian tumor is the seventh leading cause of cancer death. Ovarian tumors are often difficult to detect until they are advanced in stage or size, as symptoms are vague and insidious. An accurate and early diagnosis of malignant lesions will go a long way in the optimal management of these cases. **Aims and Objectives:** To determine the frequency of different histological types of ovarian tumors in a tertiary care center. **Materials and Methods:** This was a retrospective study included 150 cases of histopathologically proven ovarian tumors, reported in the Sree Mookambika Institute of medical sciences, over a one and half year period (January 2018 to June 2019). These were class ed according to the WHO classi cation of ovarian tumors. Clinical presentation of the patients was analyzed from archived case records. **Results:** Of 150 cases of ovarian tumors, 138 masses were unilateral (92%) and 12 were bilateral (8%). Benign neoplastic lesions were 58.7%, and malignant was 2%.In benign neoplastic, the most common neoplasm was serous cystadenoma followed by mucinous cystadenoma In malignant, the current study had 2 cases of mucinous cystadenoma with borderline malignancy and 1 case was serous papillary cystadenocarcinoma **Conclusion:** A more detailed prospective study include genetic profiling, to establish the reason for this low incidence of malignant lesions.

Keywords: Ovarian tumors, Benign, Malignant

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Introduction

Ovarian tumors represent about 30% of all cancers of the female genital system [1]. Ovarian tumor is the seventh leading cause of cancer death (age-standardized mortality rate: 4/100,000) among women worldwide and in India, it is comprising up to 8.7% of cancers in different parts of the country. Women between 65 and 84 years of age have ovarian cancer incidence rates 2 to 3 times higher than younger women. Ovarian enlargements may be cystic or solid at any age group [2]. It is the most complex ovarian tumor of women in terms of histogenesis, clinical behavior and malignant potentiality [3].

Unlike the cervix and uterus, ovarian tumors are often difficult to detect until they are advanced in stage or size, as symptoms like the fullness of abdomen, alteration in bowel habits, vague pain abdomen, intermenstrual bleeding and post-menopausal bleeding [1]. Indian cancer registry data project ovary as an important site of cancer in women comprising 8.7% of cancers in various parts of the country [1]. Neoplastic disorders can arise from (1) Mullerian epithelium, (2) germ cells or (3) sex cord-stromal cells (4) metastatic tumors and unclassified tumors. The most common lesions encountered in the ovary are functional or benign cysts and tumors [4]. The risk increases with age up to 70 years. The pattern of inheritance is autosomal dominant. The occurrence of mumps before menarche and multiple ovulations in the IVF (In vitro fertilization) program appear to increase the risk of ovarian malignancy in later life.

Geographical variations are suggestive of the fact that high dietary fat intake, the use of talc on the perineum and industrial pollution are environmental factors implicated in the high incidence in the west. Protective factors include multiparity., breastfeeding, anovulation and use of oral contraceptive pills, these contraceptives pills reduce the incidence of ovarian cancer by 40-50% and the beneficial effects extend for about 10 years after the stoppage of pills. The effects are also dose-dependent. Repeated ovulation as seen in the induction of ovulation, IVF, low parity suggests ovulation trauma to the epithelial lining to be carcinogenic. Benign ovarian tumors may occur at any point in life but they are most common during childbearing age of 20 and 45 years whereas malignant tumors are more common in older women, between the ages of 45 and 65 years.

In benign tumors, 60% of all ovarian tumors are epithelial in origin. The most common is serous cystadenoma and 20% of it is bilateral, and it is multiloculated or uninoculated and filled with thin, clear, yellowish fluid, The second most common is mucinous cystadenoma it is multilocular and filled with mucinous fluid. [3]. An accurate and early diagnosis of malignant lesions will go a long way in the optimal management of these cases [4]. The purpose of this study was to access the incidence, morphological and clinicopathological correlation, gross histological pattern, and incidence of the age distribution of ovarian tumors in our institute [2].

Aims and Objectives

To determine the frequency of different histological types of ovarian tumors in a tertiary care center.

Materials

Study design: A retrospective analytical study.

Study Setting: Department of Obstetrics and Gynaecology Sree Mookambika Institute of Medical Sciences

Study Period: June 2019-December 2019

Sample Size: All cases who attained the inclusion criteria during the study period were taken into study.

Inclusion criteria: All cases of ovarian lesions both neoplastic as well as non –neoplastic were received, in the Department of Obstetrics and Gynaecology Sree Mookambika Institute of Medical Science, during above mention period were included in the study.

Data Analysis: Data were entered in MS EXCEL and analyzed using SPSS trial version 20. Descriptive Statistics: Frequency and Percentage

Procedure: Samples were received from the operation theatre in 10% formalin, fixed overnight. after fixation, multiple bits of tissue were taken from the tumor and accompanying tissue and paraffin blocks were made. Micro sections of 5-micron thickness were taken in slides and were stained with hematoxylin and eosin stains. all lesions were classified according to WHO guidelines. Age distribution of the patients, as well as histopathological diagnosis of the ovarian masses, were analyzed. All patient data were kept confidential.

Results

A total of 150 samples of ovarian masses were received for histopathological evaluation. The age-wise distribution of the patients whose samples were received is given in Table 1. Patients in the age group of 20-39 years constituted the majority of patients (96 out of 150; 64%).

Table-1: Age-wise distribution of patients operated for ovarian masses.

Age	Frequency (total-150)	Percentage
<19	10	6.7
20-39	96	64
40-59	39	26
>60	5	3.3

Of these, 138 masses were unilateral (92%) and 12 were bilateral (8%).

Table-2: laterality of ovarian masses.

	Frequency	Percentage
Unilateral	138	92
Bilateral	12	8

The lesions were broadly classified as non - neoplastic lesions, benign neoplastic lesions, and malignant neoplastic lesions. The distribution of the cases amongst these broad categories is given in table 3. Benign neoplastic lesions constituted the majority of lesions diagnosed (88 out of 150 cases; 58.7%).

Table-3: Type wise distribution of ovarian masses.

Type	Frequency	Percentage
Nonneoplastic	59	39.3
Neoplastic-benign	88	58.7
Neoplastic -malignant	3	2

The distribution of lesions that were diagnosed as non-neoplastic is given in Table 4. Follicular cysts were the predominant non-neoplastic lesions diagnosed (29 out of 59;49.1%) followed by corpus luteum cysts (15 out of 59; 25.4%).

Table-4: Distribution of non-neoplastic lesions of the ovary.

Type of nonneoplastic lesions of the ovary	Frequency	Percentage
Follicular cyst	29	49.1
Inclusion cyst	6	10.2
Twisted cyst	2	3.4
Corpus luteum cyst	15	25.4
Endometriosis	1	1.7
Edema of ovary	6	10.2

Serous cystadenomas were the most common lesion diagnosed (39 out of 88; 44.3 % of benign neoplasia. Mucinous cystadenomas were the second most common benign neoplastic lesion diagnosed (27 out of 88; 30.7%).

Table-5: Distribution of benign neoplasms

Type of benign neoplasms	Frequency	Percentage
Serous cystadenoma	39	44.3
Mucinous cystadenoma	27	30.7
Serous cystadenofibroma	9	10.2
Mature cystic teratoma	13	14.8

Discussion

In the present study "ovarian tumors "of 150 women complaining of vague, insidious onset, dull pain in the abdomen was the most common clinical presentation in our hospital. Most women reported symptoms for a period over 6-12 months, which often progressed gradually. Most were asymptomatic at presentation and were only incidentally diagnosed. The present study revealed that 138 out of 150 ovarian specimens were unilateral (92%) and only 12 (8%) were bilateral. The findings of the present study are in concordance with other studies, out of 229 masses, 208 were unilateral (90.8%) and 21 were bilateral (9.2%) [4,5]. Many cases were unilateral and while certain cases were bilateral [6]. It was observed that 90.8% of lesions were unilateral [7]. In another study conducted, the majority of the tumors were unilateral about 68% (34/50) with right side predominance, bilateral in 32% (16/50) [8]. Certain studies showed that Metastatic tumors were found to involve the bilateral ovaries in 72%, while 49.5% of malignant serous tumors were bilateral [9]. Borderline serous tumors showed bilateral involvement more commonly (27.4%).

The majority of our patients were in the age group 20-39 years (96 patients, 64% of patients) while those in the age group 40-59 years were the second-largest group of patients (39 patients, 26% of patients). This was in concordance with the previous studies [4]. However, certain studies found that only 25.6% of their patients in the age group 20-39 years and 53.5% in the age group 40-59 years. Various studies reported different percentages of patients in different age groups [7,10,11,12]. In a previous study conducted benign neoplasms were most commonly seen in the 3rd to 5th decade, whereas malignant neoplasms were commonly seen in the 5th decade [13].

A Study done previously [14] showed that the most commonly affected age group by ovarian tumors was that of 21 to 30 years followed by an age group of 31 to 40 years. Regarding the age of patients, most of the benign tumors (160/250 or 42.4%) occurred in the reproductive age group of 21-40 years. Among the malignant tumors, most of the tumors (33/45 or 73.3%) occurred after 40 years of age.

In the present study, 59 lesions were non-neoplastic (39.3% of all specimens evaluated]; 88 lesions in the current study (58.7%) were benign neoplasms. In contrast, certain studies showed lesions that were non-neoplastic, which also included benign neoplasms [14,15]. Follicular cysts were the most common non-neoplastic lesion in the current study (49.1%) followed by corpus luteum cysts (25.4%) [8]. A study represented 86.7% of the lesions which were benign, 10.1% of cases were malignant and 3.2% of the lesions were borderline [11]. The most common non-neoplastic lesion was a simple serous cyst (49%), followed by a corpus luteal cyst (16.82%), follicular cyst (12.5%), endometriosis (9.13%). A previous study also showed non-neoplastic lesions of the ovary constitute 44%. The most common non-neoplastic lesion was a follicular cyst and malignant lesions which constituted about 2% of cases [7].

Serous cystadenomas were the most common benign neoplasm encountered in the current study (39% of benign neoplastic lesions) followed by mucinous cystadenomas (27%). When compared with the other study serous cystadenoma (64.5%) and mucinous cystadenoma (24.2%). However, a study reported serous cystadenoma (21.4%) and mature cystic teratoma (19.9%) as the most common lesions in their study [9]. A previous study showed that 95.5% of the tumor was unilateral and 4.5% bilateral [10]. The current study had only 3 cases of malignant/borderline lesions in the present study. Similarly, in a previous study, the incidence of the malignant lesion is only four.

The current study have not been able to elicit any reason for the low incidence of malignant neoplasms in the current study. Sahana N Nayak studied an of total 642 cases found that 77.7 cases were found to be neoplastic and 22.3% were non-neoplastic [16]. Among that 84% were benign, 14.2 were malignant, 1.8% were borderline. The most common lesion was serous cystadenoma (47.1%), followed by mucinous cystadenoma (18.4%) [12].

Yasmin et al study of a total of 68 cases showed 61 cases were benign and 7 cases were malignant [17]. Among these epithelial tumors were 76.5%. the most common were serous cystadenoma (24%), followed by mature cystic teratoma (18%). Nirali N Thakkar et al, Shaila N Shah et al reported that in a total of 129 cases of ovarian lesions, 109 cases (84.5%) were benign, 3 cases (2.3%) were borderline and 17 cases (13.2%) were malignant tumors [18]. Histologically, the commonest benign epithelial tumors were serous cystadenoma (55.4%) followed by mucinous cystadenoma (7%) and mature cystic teratoma (7%).

The commonest primary malignant tumor is clear cell carcinoma (2.3%) followed by serous cystadenocarcinoma (1.5%) and endometrioid carcinoma (1.5%). In a study conducted by Dimpal Modi et al, Gunvanti B Rathod et al, K.N Delwadiaet al, H.M. Goswami et al [19] out of 97 cases, 82 cases (84.5%) were benign, 2 cases (2.1%) were borderline and 13 cases (13.4%) were malignant tumors. Serous cystadenoma (52.7%) was the commonest benign tumor followed by Mucinous cystadenoma (28.4%). Among the malignant surface epithelial tumors, serous cystadenocarcinomas (8.1%) were most common followed by Mucinous cystadenocarcinomas (4.1%). In the study of M. Thirukumar et al and S. Ahilan et al, of the total 537 ovarian lesions, 209 were non-neoplastic lesions and 328 were neoplastic lesions (328) [20].

Endometriotic cysts were the predominant non-neoplastic lesions diagnosed (127/209) followed by corpus luteal cysts (48/209). Out of a total of 53 malignant cases, the majority were (31 out of 53; (58.5%) serous cystadenocarcinoma followed by mucinous cystadenocarcinoma, clear cell carcinoma, dysgerminoma, and germ cell tumors share 5 cases each. In another study conducted by Dr. Muni Bhavani Itha et al and Dr. Sathyanarayana Veeragandham et al; out of 50 ovarian tumors included,76% (38/50) were benign, 10% (5/50) were borderline and 14% (7/50) were malignant [21]. Surface epithelial tumors were most common about 76% (38/50) followed by germ cell tumors 16% (8/50 cases) and Sex cord-stromal tumors 8% (4/50 cases).

On gross examination; among 50 cases, cystic 64% (32/50 cases), solid 16% (8/50 cases), and both cystic and solid areas 20%. A study done by Mir Attaullah Khan et al showed that; out of 300, Eighty-three percent (250) tumors were benign,

1.7% (5) were borderline and 15% (45) were malignant [22]. The most common (80%) tumors of both benign and malignant origin were surface epithelial tumors followed by germ cell tumors (18.7%). Benign surface epithelial tumors comprised 80% (200/250) of all benign tumors whereas their malignant counterparts comprised 78% (35/45) of all malignant tumors [14]. Various studied showed that most common histological types were serous cystadenoma (29.9%), followed by mature teratoma (15.9%) and mucinous cystadenoma (11.1%). The major proportion of malignant ovarian tumors was contributed by surface epithelial tumors (60.9%). Serous cystadenocarcinoma was the predominant malignant tumor (11.3%) [9].

Limitations: Small Sample Size

Conclusion

The present study found out that the distribution of benign neoplasms and non-neoplastic lesions was similar to other studies; however, the current study had a very small percentage of malignant/borderline lesions (3.2%). A more detailed prospective study includes genetic profiling, to establish the reason for this low incidence of malignant lesions in our dependent population**.**

What does the study add to the existing knowledge?

Provide histological distribution of ovarian tumors in the Kanyakumari district considerably different in various parts of the state.

Author's contributions

Dr. Rema V. Nair: Study concept, and design

Dr. Sughija G.: Statistical analysis and manuscript preparation

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