Panacea Journal of Medical Sciences 2023;13(2):443–446

Content available at: https://www.ipinnovative.com/open-access-journals

Panacea Journal of Medical Sciences

Journal homepage: http://www.pjms.in/

Original Research Article

Histopathological spectrum of ovarian tumors – A prospective study at a tertiary care centre in Srikakulam

K Santhoshi Rupa[1], S Jagadeeswari[1], K Rajani[1], Lakshmi Vasavi Hanumanthu[1,*]

[1] *Dept. of Patholgy, Government Medical College, Srikakulam, Andhra Pradesh, India*

ARTICLE INFO

Article history:
Received 14-11-2021
Accepted 22-04-2022
Available online 31-07-2023

Keywords:
Ovarian tumours
Benign
Malignant
Surface epithelial tumour
Germ cell tumour

ABSTRACT

Introduction: Ovarian tumours (OTs) can occur in all age groups, account for 20% of benign and 6% of malignant cases. Increasing age, nulliparity, lower fertility and so on are the risk factors of OTs. With this a study was conducted to categorize OTs based on histopathology, to analyse with respect to the age and classify according to WHO guidelines.

Materials and Methods: This was a prospective, cross-sectional study conducted in the department of Pathology, government Medical College, RIMS, Srikakulam. Study was conducted from July 2019 to December 2020. Study protocol was approved by the institutional ethics committee. Women, aged >18yrs, suspected to be OTs, were included in the study. Specimen in the form of partial or total abdominal hysterectomy were considered. The macroscopic features were recorded in the study proforma, fixed in 10% formalin. Biopsy were taken from multiple as well as relevant areas, thoroughly processed stained with haematoxylin and eosin, examined under the light microscope.

Results: Out of 62 tumors, 90% were benign tumors (BET) followed by malignant tumors (MLT) and borderline tumors (BLT). Majority were BETs, in 31 – 40 years group. Out of 5 MLTs, maximum (3) were detected in 41 – 50 years. Majority (3) of MLTs were surface epithelial tumours.

Conclusion: Thorough study of gross and microscopic features not only help in the proper categorization but also provide a route for treatment plan as the therapeutic approach varies with the subtype of OT. The immunohistochemistry analysis may be an aid if any ambiguity in the diagnosis.

1. Introduction

The ovaries are paired intrapelvic organs and are the common site for origin of both benign and malignant neoplasms.[1] Ovarian tumours (OTs) can occur in all age groups, account for 20% of benign and 6% of malignant cases. These are the 7^{th} most common cancer in women and 8^{th} most common cause of cancer death worldwide.[2] Most of these are benign.[3]

In addition to primary tumours, ovaries are also the favourite site for metastatic tumors.[4] Increasing age, nulliparity, lower fertility and so on are the risk factors of OTs.[2] The incidence of different types of OTs is varies but an increased trend of is been observed since 1982.[1] As per recent statistics, in Asian countries the OTs occur at a rate of 2 to 6 new cases for 100,000 women per year.[4] Ovarian cancer incidence vary among different ethnic groups such as non-hispanic women have higher rates than Hispanic women.[2] Due to the high frequency of BRCA mutations, the incidence of OTs is 8 times more among the Jewish women.[2]

The risk for development of ovarian cancer in women carrying BRCA1 mutations is 44%.[2] Lynch syndrome occurs secondary to mutations. Women with Lynch syndrome are potentially at increased risk of developing

* *Corresponding author*.
E-mail address: vasavihanumanthu397@gmail.com (L. V. Hanumanthu).

https://doi.org/10.18231/j.pjms.2023.084

clear cell carcinoma, endometrial carcinoma and colorectal carcinoma at a very younger age.[5]

The OTs are either asymptomatic or present with vague symptoms like abdominal pain, mass per abdomen etc.[3] There is no availability of definite screening tests and also difficult to distinguish on the basis of clinical, radiological and gross characteristics. Therefore, the histopathological study is of utmost important in identifying the type of tumour and considered to be gold standard.[6]

With this a study was conducted to categorize OTs based on histopathology, to analyse with respect to the age and classify according to WHO guidelines.

2. Materials and Methods

This was a prospective, cross-sectional study conducted in the department of Pathology, government Medical College, RIMS, Srikakulam. Study was conducted from July 2019 to December 2020, over a period of 18 months. Study protocol was approved by the institutional ethics committee. An informed written consent was taken from the study participants.

Women, aged >18yrs, suspected to be OTs, were included in the study. Women with cysts, endometriosis, those who were non cooperative and didn't submit the consent were not considered in this research. All the eligible members who satisfy the inclusion criteria were considered in this study.

Detailed clinical history was taken from all the study participants and it was recorded. Specimen in the form of partial or total abdominal hysterectomy were considered. On the receipt of the clinical specimen, the gross examination was done. The features such as size, color of specimen were noted. As a part of the study, the external surface features and contents were noted, also recorded in the study proforma.

The specimens were fixed in 10% formalin. From the clinical specimen, 2 to 4 mm thick slices were taken from multiple as well as relevant areas. The tissues were thoroughly processed and subjected to paraffin wax embedding. Sections were mounted on a glass slide and cleared with xylene. Sections were then stained with haematoxylin and eosin. Each biopsy was labelled explicitly according to the orientation of the biopsy site and sent for histopathological examination. The stained sections were examined under the light microscope for histopathological diagnosis.The tumours were classified according to World Health Organisation (WHO) classification of female genital tumors-2020.

2.1. Statistical analysis

The data were analysed using SPSS version 21.0. Descriptive analysis was made from the data and presented in mean, percentages.

3. Results

Total 62 (100%) tumors were diagnosed in this study. Among these, 90% were benign tumors (BET). Malignant tumors (MLT) constituted to be in the second (8%; 5) position and the borderline tumors (BLT) were in the third category, 1 (1.62%). (Table 1)

Age wise, majority (29%; 18) were in 31 – 40 years group but all these were BET. Next to this, 24% (15) of OTs were detected in 41 – 50 years group; in this 17.8% (11) were BET, 4.8% (3) were MLT and just 1 (1.6%) was BLT. Another 19.4% (12) BETs were detected in 21 – 30 years group. Next to this, 9.67% (6) each OTs were detected in 61 – 70 and <20 years groups, respectively; but there was just 1 MLT was detected in <20 years group and another 01 in 51 – 60 years (Table 2).

Out of the 5 MLTs in this study, 03 (4.8%) were Surface epithelial tumours (SETs) and 2 (3.2%) were Germ cell tumours (GCTs). All (01; 1.62%) the BLTs were SETs and in the BETs, 76% (47) were SETs and 14.5% (9) were GCTs. Total, 51 (82.26%) SETs and 11 (17.74%) GCTs (Table 3).

Table 1: Distribution different OTs among the study members

Type of tumor	Number	%
Benign	56	90.32
Malignant	05	8
Borderline	01	1.62
Total	62	100

Table 2: Age wise distribution of OTs among the study participants; n (%)

Age	Benign	Borderline	Malignant	Total
< 20	05 (8)	-	01(1.6)	06 (9.67)
21 – 30	12 (19.4)	-	-	12 (19.4)
31 – 40	18 (29)	-	-	18 (29)
41 – 50	11 (17.8)	01 (1.6)	03(4.8)	15 (24)
51 – 60	04 (6.45)	-	01(1.6)	05 (8)
61 – 70	06 (9.67)	-	-	06 (9.67)
Total	56 (90.32)	01(1.62)	05(8)	62 (100)

Table 3: Types of OTs according to histology findings; n (%)

Type	Benign	Borderline	Malignant	Total
Surface epithelial tumours	47 (76)	01 (1.62)	03 (4.8)	51 (82.26)
Sex cord stromal tumours	-	-	-	-
Germ cell tumours	09 (14.5)	-	02 (3.2)	11 (17.74)
Total	56 (90.32)	01(1.62)	05 (8.06)	62 (100)

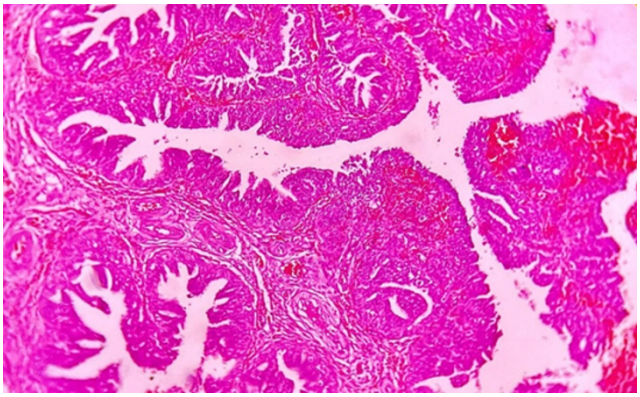

Fig. 1: Microphotograph of borderline serous tumour showing hierarchical branching papillae (40X, H&E)

Fig. 2: Gross photograph ofGranulosa cell tumour with mature cystic teratoma

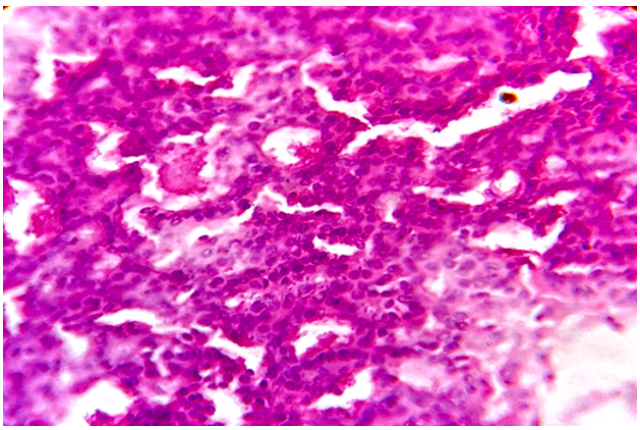

Fig. 3: Microphotograph ofgranulosa cell tumour with mature cystic teratoma showing microfollicular pattern (40X, H&E).

4. Discussion

The ovary is the complex structure in its embryology, repeated rupture during ovulation and repair may result in malignant gene mutations. The OTs can occur in any age but common in the reproductive age.[6] In our study the maximum number (53.58%) of tumours were observed between 21 – 40 years group. The sexually active group is usually prone for developing the OTs. Similar observations were reported by Verma K and Bhatia A et al.[7] and Ashraf et al.[8]

In our study majority of cases (82.26%) were SETs. Similar observations were reported in the literature.[9–13]Traditionally these tumours were thought to arise from the ovarian surface epithelium, hence referred as SETs. Now it has been clear that these tumours have diverse cell of origin.[5] These tumours resemble the tissues of Mullerian origin, which was also confirmed by immunohistochemical studies.[2] The serous tumours (STs) resemble the tubal epithelium, whereas the endometroid and clear cell tumours are similar to endometrial tissue.

High grade serous carcinoma constitutes majority of type II tumours, according to the recent data which arises from a precursor lesion, serous tubal intra epithelial lesion.[2] In this report, among the SETs, majority (62.63%) were serous tumours. Similar observations were made by Ranjana H et al.[1] In our study, we reported 35 cases of STs, out of which 91.5% (32) were BET, 2.9%(1) were BOT and 5.8% (2) were MLTs. STs accounts to 25% of all the ovarian neoplasms.[5] Majority of the tumours were seen in adults. In the past, it was thought that high grade serous carcinomas arise from low grade serous neoplasms, but now it was recognised that they differ in the cell and site of origin, molecular events during pathogenesis and response to chemotherapy.[5]

One case of borderline ST was reported in our study. Serous borderline tumour is a non-invasive, low grade neoplasm, usually seen around 50 years of age. Prognosis is good with these tumours, survival of patients with stage I tumour is similar to that general population.[2] We received a cystic mass of size 5×3.5×2.5cm. Surface was smooth. On cut section, cyst was filled with serous fluid and multiple papillary projections were seen. Microscopic examination revealed multiple long hierarchical branching papillae lined by cuboidal epithelium showing mild pleomorphism and stratification. (Figure 1) Two cases of high-grade serous carcinomas were also reported in our study. Both the cases have showed bilateral ovarian involvement and on microscopic examination they showed a solid, glandular and papillary architecture with cells exhibiting marked cytological atypia, high mitotic activity and atypical mitosis. These tumours are associated with higher rates of recurrence and poor prognosis.

In our study, we reported a rare case of Granulosa cell tumour with mature cystic teratoma occurring

synchronously in the same ovary in a 55 year participant. Similar findings were reported in perimenopausal women by Trivedi P et al.[14] It usually occurs in infants and children younger than 10 years of age.[2] It is a rare neoplasm composed of both germ cell and sex cord stromal elements. The microscopic findings revealed individual cells with longitudinal nuclear grooves and characteristic Call - Exner bodies. Sections from the cystic area showed mature squamous epithelium, adipose tissue and salivary gland tissue. (Figure 2)

We have also reported a case of mixed GCT. Similar case was reported by Zareena S et al.[15] The GCTs account for 20% of all the OTs.[2] The histopathological examination showed immature neuroectodermal tissue occupying less than one low power field in one slide, cartilage, adipose tissue, squamous epithelial islands, bronchial epithelium, glial tissue along with reticular and microcystic areas, schiller- duval bodies and hyaline globules at focal areas. (Figure 3)

5. Conclusion

In our study, the BETs are more common than malignant counterparts. Thorough study of gross and microscopic features not only help in the proper categorization but also provide a route for treatment plan as the therapeutic approach varies with the subtype of OT. The immunohistochemistry analysis may be an aid if any ambiguity in the diagnosis.

6. Conflict of Interest

There are no conflicts of interest in this article.

7. Source of Funding

None.

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Author biography

K Santhoshi Rupa, 3rd Year Post Graduate

S Jagadeeswari, Associate Professor

K Rajani, Associate Professor

Lakshmi Vasavi Hanumanthu, Associate Professor

Cite this article: Rupa KS, Jagadeeswari S, Rajani K, Hanumanthu LV. Histopathological spectrum of ovarian tumors – A prospective study at a tertiary care centre in Srikakulam. *Panacea J Med Sci* 2023;13(2):443-446.