HISTOMORPHOLOGICAL SPECTRUM OF OVARIAN NEOPLASMS IN A TERTIARY CARE CENTRE

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Histomorphological spectrum of ovarian neoplasms in a tertiary care centre

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Abstract

Introduction: Ovary is the second most common site of gynaecological malignancies in India and therefore ovarian tumours need to be studied under the microscope for accurate diagnosis and management.

Aim: This study aims to study the spectrum of ovarian tumours and calculate their incidence and age-distribution.

Materials and methods: This study was conducted in the Department of Pathology, Sri Muthukumaran Medical College, Hospital & Research Institute, Chennai, during the year 2022.

Results: Among a total of 68 ovarian neoplasms studied, benign tumours (61.7%) were more common and most of the patients were in the fourth decade of life. The commonest histomorphological category observed was Surface Epithelial Tumours (69.1%), followed by Germ Cell Tumours (17.6%).

Conclusion: Ovarian Neoplasms have a wide range of histomorphological features and therefore histopathology is vital in enabling the clinicians in early diagnosis and treatment.

Keywords: Germ cell tumours, Histopathology, Ovarian neoplasm, Surface epithelial tumours

1. Introduction

Ovaries are paired pelvic organs located on either side of uterus close to the lateral pelvic wall behind the broad ligament and anterior to the rectum [1].

Under the influence of hormones ovaries can undergo various changes throughout life. Ovarian tumours are heterogeneous group of neoplasms than can originate from any of the three cell types in the normal ovary: the multipotent surface (coelomic) epithelium, the sex cord stromal cells and the totipotent germ cells [2]. Surface Epithelial Tumours form the majority of ovarian neoplasms (almost 90%). Germ cell and sex cord stromal cell tumours are comparatively less common, accounting for 20–30% of ovarian tumours. Ovarian neoplasms form the fifth most prevalent malignancy overall and the second most common gynaecological malignancy accounting for 3% of all malignant neoplasms [3]. The incidence is 25% among the gynaecology malignancies [4]. The important risk factors for ovarian neoplasm include nulliparity, high socioeconomic status, environmental and genetic factors. Owing to vague symptoms and late clinical presentation, ovarian neoplasms are usually detected at the later stage of the disease and hence known as silent killer [5].

This study was done to assess the frequency of ovarian neoplasms and classify the histomorphological pattern as per current WHO classification and analyse the age-wise distribution.

2. Material & methods

Study design—Prospective, observational.

Study Place—The study was conducted in the Department of Pathology in Sri Muthukumaran Medical College Hospital & Research Institute, a tertiary care hospital in Mangadu.

Study Period—The study duration was 1 year from January 2022–December 2022.

Sample size—The sample size was 68.

Inclusion Criteria: All histopathologically-proven ovarian neoplasms of all age groups.

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2537-0928/0 2023 General Organization of Teaching Hospitals and Institutes (GOTHI). This is an open access article under the CC BY-NC-SA 4.0 license (https://creativecommons.org/licenses/by-nc-sa/4.0/).
Exclusion Criteria: All Normal ovary, Non neoplastic ovarian lesions, post-chemotherapy ovaries and autolyzed specimens were excluded.

The present study was a prospective observational study conducted in the Department of Pathology in a tertiary care hospital in Mangadu.

Relevant clinical data with age were noted from the histopathological requisition form. All the received ovarian specimens were fixed in 10% neutral buffered formalin. A thorough gross examination was done according to the standard protocol with meticulous examination for cysts, type of cystic fluid, any solid area, papillary projections, hemorrhage and necrosis. Tissue processing was done as per standard procedure and paraffin-embedded blocks were made. Tissue sections were stained by hematoxylin and eosin followed by microscopic examination. The Ovarian neoplastic lesions were classified according to the recent WHO classification of ovarian tumors.

3. Results

In our present study we had analysed a total of 68 ovarian neoplasm cases which included specimens received as solitary ovarian mass, unilateral or bilateral cystectomies or as part of hysterectomies with bilateral salpingo-oophorectomies over a period of one year. Among the neoplastic ovarian lesions, 42 (61.7%) cases were benign, 02 (2.9%) cases were borderline and 24 (35.3%) cases being malignant (Fig. 1).

3.1. Age-wise distribution of ovarian neoplasms

The most common age-group of all ovarian neoplasms was the fourth decade, followed by the third decade.

Surface Epithelial Tumours had a peak incidence in the age-group of 31–40, while Germ Cell Tumours were more common in the younger age-group. Metastatic Tumours were commoner in older age-group Fig. 2, Table 1.

Among the 68 ovarian neoplasms, Surface Epithelial Tumours were the most common category, comprising 69.1% (47 cases) followed by Germ Cell Tumours (17.6%, 12 cases), Sex Cord Stromal Tumours (9%, 06 cases) and Metastatic Tumours (1.4%, 1 case).

3.2. Distribution of surface epithelial tumours

Among the 47 Surface Epithelial Tumours, 32 cases (68%) were Serous, followed by Mucinous (23.4%, 11 cases), Benign Brenner Tumour (6.3%, 3 cases) and 1 case of Clear Cell Carcinoma (2.3%).

Serous neoplasms were further classified into Benign (19 cases), Borderline (1) and Malignant (12). Mucinous neoplasms were classified into Benign (9), Borderline (1) and Malignant (1) Figs. 3 and 4.

3.3. Distribution of germ cell tumours

Among the 12 Germ Cell Tumours, we encountered 9 teratomas (75%), of which 6 were mature cystic teratomas, 2 were Immature Teratomas and 1 was a Monodermal Teratoma (Struma Ovarii). There were 2 (16.7%) cases of Dysgerminoma and 1 (8.3%) Yolk Sac Tumour in this period Fig. 5.

3.4. Distribution of sex cord stromal tumours

Of the 6 Sex Cord Stromal Tumours, 4 cases (66.7%) were Granulosa Cell Tumours and the remaining 2 (33.3%) were Fibroma Fig. 6.

![Nature of Neoplasm](image_url)
3.5. Distribution of miscellaneous tumours

We also encountered one ovarian haemangioma, one leiomyoma and one case of metastatic carcinoma of gastrointestinal origin, to ovary Fig. 7.

Table 1. Histomorphological spectrum of Ovarian neoplasm of our present study.

<table>
<thead>
<tr>
<th>Tumour</th>
<th>Nature</th>
<th>Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface epithelial tumours</td>
<td></td>
<td>47</td>
<td>69.1%</td>
</tr>
<tr>
<td>A. Serous</td>
<td>Benign</td>
<td>32</td>
<td>(68%)</td>
</tr>
<tr>
<td>Serous cystadenoma</td>
<td>Benign</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Serous cystadenolipobroma</td>
<td>Benign</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>Serous borderline tumour</td>
<td>Borderline</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>Serous carcinoma</td>
<td>Malignant</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>B. Mucinous</td>
<td></td>
<td>11</td>
<td>(23.4%)</td>
</tr>
<tr>
<td>Mucinous cystadenoma</td>
<td>Benign</td>
<td>09</td>
<td></td>
</tr>
<tr>
<td>Mucinous borderline tumour</td>
<td>Borderline</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>Mucinous carcinoma</td>
<td>Malignant</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>C. Clear cell tumours</td>
<td></td>
<td>01</td>
<td>(2.1%)</td>
</tr>
<tr>
<td>Clear cell carcinoma</td>
<td>Malignant</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>D. Brenner Tumour NOS</td>
<td>Benign</td>
<td>03</td>
<td>(6.3%)</td>
</tr>
<tr>
<td>Germ cell tumour</td>
<td></td>
<td>12</td>
<td>17.6%</td>
</tr>
<tr>
<td>A. Mature cystic Teratoma</td>
<td>Benign</td>
<td>06</td>
<td></td>
</tr>
<tr>
<td>B. Immature teratoma</td>
<td>Malignant</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>C. Monodermal teratoma</td>
<td>Benign</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>(Struma ovarii)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Dysgerminoma</td>
<td>Malignant</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>E. Yolk sac tumour</td>
<td>Malignant</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>Sex cord stromal tumour</td>
<td></td>
<td>06</td>
<td>9%</td>
</tr>
<tr>
<td>A. Granulosa cell tumour</td>
<td>Malignant</td>
<td>04</td>
<td></td>
</tr>
<tr>
<td>B. Fibroma</td>
<td>Benign</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>03</td>
<td>4.3%</td>
</tr>
<tr>
<td>A. Ovarian Leiomyoma</td>
<td>Benign</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>B. Ovarian Hemangioma</td>
<td>Benign</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>C. Metastatic tumour</td>
<td>Malignant</td>
<td>01</td>
<td></td>
</tr>
</tbody>
</table>

4. Discussion

In our current study, ovarian specimens were studied extensively and histomorphological classification of neoplasms was done according to WHO Classification of Ovarian Neoplasms. Most of the tumours were benign (61.7%) followed by malignant (34.3%) and borderline tumours (2.9%) (Fig. 1, Table 2).

The most common age-group of all ovarian neoplasms was the fourth decade in this study. Surface Epithelial Tumours (69.1%) was the most common category, followed by Germ Cell Tumours (17.6%), Sex Cord Stromal Tumours (9%) and others (4.3%) which included Ovarian Leiomyoma, Ovarian Haemangioma and Metastatic Tumour [9].
Serous Tumours were the most commonly diagnosed Surface Epithelial Tumours, similar to the studies done by Hathila et al., Kanasagara and Sampurna et al. [6,8,10]. Benign Serous tumours were the leading diagnosis, followed by malignant and borderline serous tumours. This report was consistent with studies done by Hathila et al., Kanasagara et al. and Sampurna et al. [6,8,10]. Our study reports included malignant epithelial tumours among which Serous Carcinomas were the most common followed by one case each of Mucinous Carcinoma and Clear Cell Carcinoma, correlating with result of study done by Batool et al. [7] (Tables 3 and 4).

Germ Cell Tumours ranked as the second most common Ovarian Tumour in our study forming 17.6% of cases, in similarity with the study done by Hathila et al. and Batool et al. [6,7]. Teratoma was the leading cause of Germ Cell Tumours in our study, in similarity with the study done by Sampurna et al. [10]. Mature Cystic Teratoma was the predominant diagnosis (7 cases) followed by Immature Teratoma of Grade I and II (2 cases), similar to the results of study done by Batoool et al. [7]. One case of Struma Ovarii was diagnosed in a 36-year old multiparous woman. The next most common germ cell tumour reported in our study was Dysgerminoma (16.7%) followed by Yolk Sac Tumour (8.3%), similar to the study done by Batool et al. [7]. The malignant germ cell tumours encountered in our study were Immature Teratoma (2 cases), Dysgerminoma (2 cases) and Yolk Sac Tumour (1 case).

Around 9% of Sex Cord Stromal Tumours were reported in our study, correlating with the study of Hathila et al. [6]. The diagnosis of pure sex cord tumours were higher than that of pure stromal tumours. In this study, compared to the study done by Batool et al., Granulosa Cell Tumours were the most common diagnosis, followed by Fibroma. We reported 4 cases of Malignant Adult Granulosa Cell Tumour. Among Pure Stromal Tumours, only Fibroma (2 cases) was reported in our study, in contrast to the study done by Batoool et al., where Fibroma was the predominant type [7].

Our study also reported ovarian neoplasms that originated from smooth muscle and blood vessels apart from the three cell-types in the normal ovary. They were placed under the category of ‘Others’ (4.3%). Two benign cases reported under this category included Ovarian Leiomyoma (1) and Ovarian Haemangioma (1). One case of malignant tumour...
reported included metastasis to ovary, where the patient had a primary tumour in the gastrointestinal tract. This correlated with the study by Sampurna et al. [10].

4.1. Conclusion

Our present study was undertaken to analyse various ovarian neoplastic lesions with age-wise distribution.

Our study brings to limelight a wide histomorphological spectrum of ovarian neoplasms with benign tumours being the most common lesions and with majority of cases presenting in the 4th decade. Overall Surface Epithelial Tumours accounted for the major bulk followed by Germ Cell Tumours.

Due to diversity of ovarian neoplasms, extensive sampling especially from solid areas with histopathological analysis still remains gold standard method for diagnosis. As malignant ovarian neoplasms carry high mortality with poor prognosis, early diagnosis with proper histomorphological categorization aids in timely and proper management of patients.

Conflicts of interest

None declared.

References


