SPECTRUM OF OVARIAN LESIONS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

BACKGROUND

Ovarian tumours are the 7th most common cause of mortality. About 80% ovarian lesions are benign. The tumours that occur in the ovary are usually primary and metastatic cases have occasionally been reported. We wanted to analyse the spectrum of lesions in ovary.

METHODS

This is a retrospective study done in 3228 women who came to our hospital during the period January 2017-December 2018. All patients who had undergone ovariotomy were included in the study irrespective of whether hysterectomy was done or not.

RESULTS

A total of 3228 cases were examined of which 47.5% cases were normal. Non-neoplastic lesions constituted 38.7%. Among the neoplastic lesions, 12.7% cases were benign and 0.86% were malignant.

CONCLUSIONS

Ovarian tumours include a wide spectrum of lesions. Emergence of borderline tumours with prognostic difference from benign and malignant counterparts has added a new dimension to the research in field of ovarian tumours. Correlation of clinical and radiological findings has assisted the pathologist to arrive at a definite conclusion in almost all cases. Even then, we may require the help of modern techniques like IHC and hormonal studies. Understanding in detail about the different lesions in the ovary, their prognostic implications and differences in the treatment is also crucial in diagnosis. A proper, complete and definite diagnosis helps the clinician to initiate the best conservative treatment available.

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BACKGROUND

Ovary is unique in the spectrum of lesions that can arise from it[1]. Tumours can arise from the wide variety of cells in ovary. This is due to complex structure of ovary as well as its specific functions[1]. Most common lesions encountered in ovary are functional or benign cysts and tumours. Ovarian neoplasm is usually detected towards late stage and are become large in size because of their presentation with mild symptoms[2]. Majority of the ovarian neoplasms are benign, although it's one of the most usual sites for primary neoplasm. But literatures of metastasis to ovary have also occasionally reported. Diagnosing ovarian tumours on the basis of clinical and gross characters may be challenging but provide important clues in arriving at diagnosis. Sex cord stromal tumours are mostly unilateral whereas metastatic tumour usually have a bilateral presentation. Most of the benign surface epithelial tumours have a cystic presentation. On gross examination, solid tumours with papillary projections may favour malignancy. However microscopic features of by these tumours help in arriving at an accurate diagnosis[3].

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Nonneoplastic lesions of the ovary may presents as a pelvic mass and are can also be associated with abnormal hormonal levels, simulating an ovarian neoplasm creating a dilemma regarding diagnosis on clinical examination, at time of surgery, or on pathologic examination. Most of these lesions are seen during the reproductive age group and can be associated with infertility[3]. These lesions must be properly identified and treated, so that conservative treatment can be done wherever possible, thereby avoiding unnecessary oophorectomy.

Low-grade serous carcinoma belongs to the Classic type I tumours is, which is usually associated with KRAS and BRAF mutations. These patients don't have Tp 53 mutation. High-grade serous carcinoma belongs to the category of type II tumours characterized by a high level of genetic instability and TP53 mutations is seen in nearly almost all cases and are highly unstable. These tumours are rapidly growing, very aggressive and are usually diagnosed at an advanced stage. Type 1 and type 2 tumours develop by means of separate pathways. Borderline serous tumour/atypical proliferative tumours is the precursor of low-grade serous carcinoma. Non-invasive serous tumours with micropapillary pattern are probably be associated with synchronous or metachronous invasive disease[4].

Only a few cases have been reported regarding development of high-grade serous carcinoma from a low-grade serous carcinoma as most of the low-grade serous carcinomas develop along a different pathway that is quite unambiguous from the pathway of their high-grade counterparts. Favoured cell of origin for serous neoplasia is ovarian surface mesothelium. It has been found that as a result of ovulatory trauma, there can be Mullerian

metaplastic change to a tubal epithelial type, with further neoplastic transformation related to mutational events. Almost all cases of serous epithelial tumours arise generally from metaplastic change of the surface mesothelium. According to recent studies in women who are having BRCA mutations, an alternative tubal origin is being put forward as an important source of high-grade serous carcinomas which was based on the evaluation of risk reducing salpingo-oophorectomy specimens. Small non-invasive and invasive carcinoma was found to be more common in fallopian tube than ovary. These findings are on the basis of complete sectioning of the ovaries and fallopian tubes in women who were at high risk of developing ovarian cancer, prophylactic salpingo-oophorectomy specimens. The study was conducted according to the SEE-FIM protocol. The non-invasive intraepithelial lesions are being labelled as serous tubal intraepithelial carcinoma (STIC) or high grade serous tubal intraepithelial neoplasia. They have cytological features almost identical to high-grade serous ovarian cancer and also show TP53 mutation, aberrant p53 protein expression, high proliferation indices and marked genomic instability[5].

Epidemiologic studies of ovarian cancer depend on accurate tumours classification. Recent studies revealed that a huge percentage of mucinous carcinomas involving the ovaries were not primary, but metastatic lesions from elsewhere. The association between smoking and ovarian mucinous carcinoma is not clear because some smoking-associated mucinous carcinomas with their primaries outside ovary such as pancreatic cancer can behave in the same manner as primary ovarian mucinous tumours when they metastasize to the ovary creating diagnostic challenge. Rates of ovarian cancer increase proportionately with age. Differences in hereditary syndromes and differences in the pathogenesis of different types of ovarian carcinoma can be assessed with the help of varying age presentation among the sub groups. On average, younger women in their early reproductive age with invasive ovarian cancer will have a more favourable stage distribution and other prognostically favourable features. This helps in having a better prediction in outcome compared to others in elderly age group.

Ovarian carcinogenesis can broadly be classified into 2 entities: malignant transformation and peritoneal dissemination. It was presumed that benign, "borderline, " and malignant ovarian tumours contemplate successive steps in malignant transformation, irrespective of their type of differentiation like, serous, mucinous, endometrioid, or clear cell, by many authors till recently. According to many of the recent literatures the concept that ovarian carcinoma begins in the ovary and spreads sequentially from the ovary to the pelvis, abdomen, and then later to distant sites is being challenged. The old concept that ovarian cancer progress over time from well to poorly differentiated does not appear to be rational[6].

About 2/3rd of ovarian tumours occurs in reproductive age group, whereas incidence in children is less than 5%. Natural history and response to treatment vary considerably from one group of tumours to others. As there are no screening tests for ovarian tumours and these tumours cannot be confidently distinguished from one another on the basis of their clinical, radiological or gross characteristics, it is important to determine the histological pattern of ovarian tumours to achieve optimum treatment response as prognosis depends on the degree of differentiation

From the latest researches, the various molecular alterations involved in serous carcinogenesis has been revealed. Now the pathologists have two different types of serous carcinoma. In the fourth edition of the WHO classification, low-grade serous carcinoma is the term used to label those serous neoplasms that are associated with serous borderline tumours/atypical proliferative tumours and include tumours which were previously categorized as grade 1 serous carcinoma. The term high-grade serous carcinoma is used to denote most of the malignant non-uterine serous carcinomas of the female genital tract previously classified as grade 2 or grade 3 serous cancers. This do not otherwise require additional grading. For several reasons, the consensus meeting held in Lyon before the publication of new classification system did not lead to settlement on a single, unifying concept for borderline tumours of the ovary[4].

First, borderline serous tumours include a unique group of tumours that is biologically distinguishable from borderline tumours of other histological types. Borderline serous tumours can present at high stage, with or without nodal involvement. These are associated with a distinct, low, risk of transformation in time to low grade serous carcinoma. If they are adequately sectioned, in contrast, non-serous borderline ovarian tumours are restrained to the ovary and generally poses no risk for transformation.

Secondly, significant differences are existing among various gynaecological pathologists in association with borderline serous tumours in particular. Some pathologists have labelled the borderline serous tumours as benign and reported these lesions as atypical proliferative tumour, while others viewed that the borderline tumours terminology uniquely captures the true and the strange nature of these tumours. There are only very less literatures regarding malignant behaviour in well sampled tumours. This showed that the application of the terminology borderline tumours to the non-serous types is wrong. This has made many pathologists to favour the term atypical proliferative for these kinds of lesions. However, as the term border line has been used for long time, it has been preserved. Accordingly, both terminologies are accepted in the current (Fourth) edition of the WHO classification[4].

METHODS

This is a retrospective study done in 3228 women who came to our hospital during the period January 2017- December 2018. All patients who had ovariotomy were included in the study irrespective of whether hysterectomy was done or not. All samples were collected from the operation theatre and preserved in buffered formalin. Representative sections were taken and stained with standard Haematoxylin and eosin stain. All the lesions were classified using WHO guidelines

RESULTS

A total of 3228 cases were studied among which 1536 (47.5%) were normal. Among the remaining 1692 cases 73.8% cases were non neoplastic and 24.40% cases were benign. Malignant cases accounted for only 1.65% of cases.

Follicular cyst	983	58.09%
Lutein cyst	157	9.27%
Endometriotic cyst	107	6.32%
Hyperthecosis	1	0.05%
Ectopic gestation	2	0.11%

Table 1. Non-Neoplastic Cases

Among the non-neoplastic cases, most common was follicular cyst accounting for 58.09% of the total cases followed by lutein cyst.

Serous cystadenoma	284	16.78%
Serous cyst adenofibroma	6	0.35%
Mucinous cystadenoma	53	3.13%
Teratoma	70	4.13%

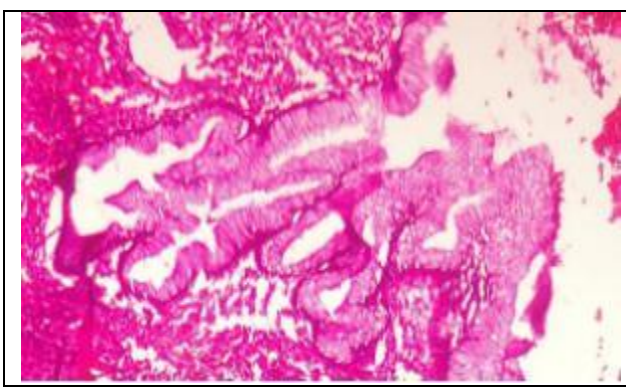
Table 2. Benign

Serous cystadenoma accounted for almost 16 % of the total cases.

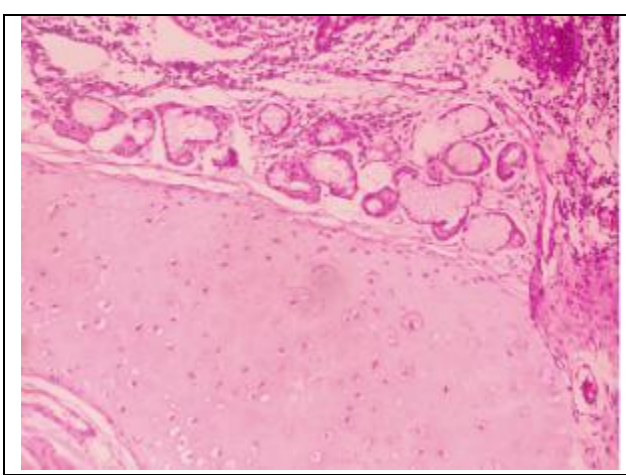
Papillary serous cystadenocarcinoma	6	0.35%
Granulosa cell tumour	7	0.41%
Yolk sac tumour	1	0.05%
Sclerosing stromal tumour	1	0.05%
Sex cord stromal tumour	10	0.59%
Brenner tumour	3	0.17%

Table 3. Malignant

Sex cord stromal tumours accounting for 0.59% cases was the commonest in malignant cases.



Mucinous Adenocarcinoma



Teratoma Ovary

DISCUSSION

Although ovarian tumours are one the commonest entities their diagnosis often possess a challenge due to variety of pathologic conditions affecting the ovary. Thus, a detailed evaluation and expertise in morphology can help in improving the diagnosis. In our study, 1250 cases were non neoplastic lesion which accounted for 38.7% which was compatible with study done by Prakash et al[2] which was 44% and Zaman et al[7] which was 68.87%. Follicular cyst was the most common non neoplastic lesion in our study which was 30.4% followed by lutein cyst and endometriotic cyst, 2.8% and 3.34% respectively which was compatible with studies done by Prakash et al and Maliheh et al[8]. Benign neoplastic lesion constitutes around 24.47 which was less than our comparative studies as we have included hysterectomy cases with attached ovary, where ovary didn't have any significant neoplasms. The percentage was shown much higher in studies done by Pachori et al[9] which was 72.3% and Thakkar[10] which was 84.5%. Most of the tumours belonged to epithelial tumours category in our study which was 79.13% which was comparable to results of Krishna M et al[11] which was 77% and Badge S et al[12] which was 77%. In our study, 28 malignant cases were there which was all primary accounting for 100%, similar observations were made by Bhagyalekshmi et al[13] which was 98.5% and Thejasvani et al[14] which was 98.9%. Mature cystic teratoma constitutes about 15.8% of all tumours. Gupta S C et al[15] and Couto F et al[16] showed an incidence of 18.46% and 23.1% respectively. Among the malignant tumours Granulosa cell tumours accounted for 25% of cases which was compatible with the study done by Neha G et al[17] which was 18.8%.

CONCLUSIONS

Ovarian tumours include a wide spectrum of lesions. Emergence of borderline tumours with prognostic difference from benign and malignant counterparts has added a new dimension to the research in field of ovarian tumours. Correlation of clinical and radiological findings has assisted the pathologist to arrive at a definite conclusion in almost all cases. Even then, we may require the help of modern techniques like IHC and hormonal studies. Understanding in detail about the different lesions in the ovary, their prognostic implications and differences in the treatment is also crucial in diagnosis. A proper, complete and definite diagnosis helps the clinician to initiate the best conservative treatment available.

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