RESEARCH ARTICLE

THE RELATIVE FREQUENCY AND HISTOPATHOLOGICAL PATTERN OF OVARIAN MASSES – 11 YEAR STUDY AT TERTIARY CARE CENTRE

Hardik Makwana, Alpesh Maru, Nayana Lakum, Ashok Agnihotri, Naresh Trivedi, Jayesh Joshi
Department of Pathology, CU Shah Medical College & Hospital, Surendranagar, Gujarat, India

Correspondence to: Hardik Makwana (dr_hardik82@yahoo.com)

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ABSTRACT

Background: Ovarian tumours are one of the major cause of gynaecological problems in females and present marked variation in their histological types. Relative frequency of these lesions is different for Western and Asian countries.

Aims & Objective: This study was designed to find out frequency of various histological patterns of ovarian tumours in patients attending Pathology department of a teaching institute in Gujarat.

Material and Methods: A retrospective – series study was conducted on 337 cases of ovarian masses, reported from January 2002 to December 2012.

Results: Mean age of the subjects was 33.6 years, ranging from 8 to 70 years. In a total 337 cases of ovarian masses, 197 (58.46%) were non-neoplastic and 140 (41.54%) were neoplastic. Among neoplastic lesions, 77.14% (108/140) were benign, 3.57% (5/140) were borderline and 19.29% (27/140) were malignant. The commonest non-neoplastic lesion was luteal cyst (59/197) followed by simple serous cyst (56/197). The commonest malignant tumour was serous cystadenocarcinoma (11/27) followed by mucinous cystadenocarcinoma (5/27). The commonest borderline tumour was borderline serous tumour (4/5).

Conclusion: Non-neoplastic lesions were more common than neoplastic lesions. Among neoplastic lesions benign tumours were common. The commonest benign tumour was serous cystadenoma and malignant was serous cystadenocarcinoma. The commonest non-neoplastic lesion was luteal cyst. Among histological types of ovarian tumours, surface epithelial tumours dominated the other types.

Key-Words: Ovarian Tumours; Luteal Cyst; Serous Cystadenoma; Serous Cystadenocarcinoma

Introduction

The incidence of cancer is increasing in developing countries.[1,2] There are marked differences in distribution of different cancers in different regions of the world.[2,3] Ovarian cancer is the most frequent cause of death from cancer in women in Europe, United States & Eastern India.[4] Indian cancer registry data project ovary as an important site of cancer in women, comprising up to 8.7% of cancers in different parts of the country.[5] The lifetime risk of ovarian cancer in women with no family history is 1.6% with one affected first degree relative is 5%[6] & 7% with two or more affected first degree relatives.[7] Ovarian tumours are insidious in onset and usually diagnosed at a late stage. They are rare in young age group.[8] They commonly present with abdominal pain, a lump or menstrual irregularities.[9] In addition to biopsy, various diagnostic modalities include transvaginal ultrasonography, MRI, positron emission tomography[10] and markers like serum CA-125.[7]

Diverse histopathology are common in ovarian lesions. Relative frequency of different ovarian tumours is different for western world & Asian countries. For example Surface epithelial tumours account for 50.0-55.0% of all ovarian tumours & their malignant counterpart for approximately 90.0% of all ovarian cancers in western world whereas this figure is 46.0-50.0% and 70.0-75.0% respectively in Japan. Similarly mucinous tumours account for 12.0 to 15.0% of all ovarian tumours in western world. This figure is 20.0-23.0% for Japan. Germ cell tumour account for 30.0% of primary ovarian tumours & malignant germ cell tumours account for 3.0% of all ovarian cancers in western world.[11] Determination of these patterns is important for diagnosis, management and prognosis.

This study was conducted to find out the histopathological patterns of ovarian lesions in patients attending a teaching hospital in North-West Saurashtra region of Gujarat, India.

Materials and Methods

A retrospective case - series study was carried out on 337 patients who had undergone surgical oophorectomy. Samples were analysed in the Pathology department of CU Shah Medical College, Gujarat. All histopathologically diagnosed cases of ovarian lesions referred to this department during January 2002 to December 2012 were included in this study. These were mostly referred from gynaecology & obstetric department of CU Shah Medical College, but a few were referred from other hospitals in the vicinity. The retrospective data was retrieved from the record files of pathology department. Patient with

abdomino-pelvic masses other than of ovarian tumours diagnosed on histopathology were excluded from the study. The histological characterisation of ovarian tumours was done according to "The WHO classification of ovarian tumours, 2003". The acquired data was analysed using the descriptive statistics.

Results

During the study period January 2002 to December 2012, three hundred and thirty seven consecutive cases of ovarian lesions were selected. Ages of the patients and their histopathological diagnosis were recorded. Patients were divided into seven age groups, with a difference of 10 years in each group. The commonest age group affected was from 21 to 30 years followed by 31 to 40 years. The youngest patient was 8 years old and the oldest was 70 years old. (Table 1)

Table-1: Age distribution of cases of ovarian mass (n=337)

Age (years)	No. of Cases	Percentage
1 – 10	1	0.30
11 – 20	15	4.49
21 – 30	133	39.49
31 – 40	105	31.17
41 – 50	49	14.45
51 – 60	31	9.20
61 – 70	03	0.90
Total	**337**	**100**

Table-2: Distribution of various types of non-neoplastic ovarian lesions (n=197)

Non-Neoplastic Lesions	No. of Cases	Percentage
Luteal cyst	59	29.95
Simple serous cyst	56	28.43
Haemorrhagic cyst	35	17.77
Follicular cyst	38	19.29
Oophoritis	04	2.03
Endometriosis	04	2.03
Miscellaneous	01	0.50
Total	**197**	**100**

Table-3: Distribution of various types of ovarian tumours (n=140)

Types of Ovarian tumours	No. of Cases	Percentage
Surface epithelial tumour	92	65.71
Germ cell tumour	32	22.86
Sex cord stromal tumour	13	9.29
Metastatic tumour	03	2.14
Total	**140**	**100**

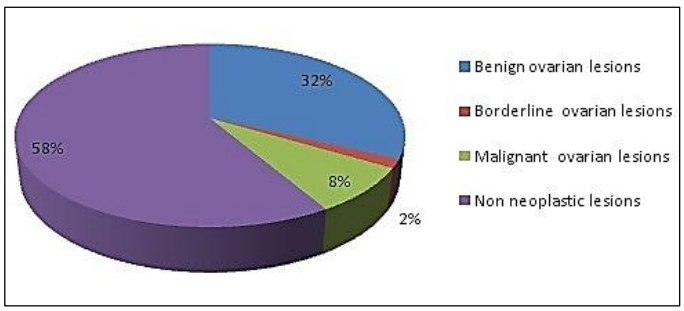

Figure-1: Distribution of ovarian lesions

In a total of 337 ovarian lesions, 197/337 (58.46%) were non-neoplastic and 140/337 (41.54%) were neoplastic. The neoplastic lesions comprised 108/337 (32.05%) benign, 5/337 (1.48%) borderline and 27/337 (8.01%) malignant tumours (Figure 1). In a non-neoplastic lesions, luteal cyst was the predominant category (59/197; 29.95%) followed by simple serous cyst (56/197; 28.43%) (Table 2). The neoplastic tumours were divided in four groups, namely, Surface epithelial tumours, Germ cell tumours, Sex-cord-stromal tumours and Metastatic tumours. Surface epithelial tumours were maximum in number (92/140; 65.71%), followed by Germ cell tumours (32/140; 22.86%) (Table- 3).

Frequency pattern of different types and subtypes of benign and malignant ovarian neoplasms (n=140) is show in table 4. The commonest histological types is Surface epithelial tumours (92/140; 65.71%) followed by Germ cell tumours (32/140; 22.86%). Among all the benign lesions (n=108) serous cystadenoma is the commonest (49/108), while dermoid cyst is at the second number (26/108). On the other hand, among all the malignant lesions (n=27), serous cyst adenocarcinoma is at the top (11/27), followed by mucinous cystadenocarcinoma (5/27). The commonest borderline tumour was borderline serous tumour (4/5). Least common lesions include Dysgerminoma (1/140), Endodermal sinus tumour (1/140), Clear cell adenocarcinoma (2/140), and Thecoma-fibroma (2/140).

Discussion

The ovary is complex structure in embryology, histology, steroidogenesis and as such in its potential for malignancy, with its different components, germ cells, follicular cells and mesenchymal tissue each having different capability to form varied tumours.

Age range of our subjects was from 8 to 70 years. Our study shows the maximum incidence of ovarian masses between 21 to 40 years of age. This differs from the western data where it is between 50 and 70 years[12] but correlates with other study conducted in India.[13-15] In our study non-neoplastic lesions were 58.46% (197/337) of all ovarian lesions and neoplastic lesions were 41.54% (140/337). Neoplastic lesions contained 32.05% (108/337) benign, 8.01% (27/337) malignant and 1.48% (5/337) borderline. These results were correlates with other study in India.[13-15] The pattern of distribution of non-neoplastic lesions is quite variable in other studies.[13-15]

Among the major histological types, the commonest types of ovarian neoplasm seen in our study was surface

Table-4: Frequency of different types of ovarian tumours. (n=140; No. of each histological types is given in parenthesis)

Histological Classes	Benign Tumours (n =108)	Borderline Tumours (n=5)	Malignant Tumours (n = 27)	Total	%
Surface Epithelial Tumour	Serous cyst adenoma (49) Mucinous cyst adenoma (13) Brenner tumour (3)	Serous tumours (4) Mucinous tumours (1)	Serous cyst adenocarcinoma (11) Mucinous cyst adenocarcinoma (05) Endometrioid carcinoma (04) Clear cell adenocarcinoma (2)	92	65.71
Germ Cell Tumour	Dermoid cyst (26) Strauma ovary(04)	-	Endodermal sinus tumor (01) Dysgerminoma (01)	32	22.86
Sex Cord Stromal Tumor	Granulosa cell tumours (11) Thecoma fibroama(2)	-	-	13	9.29
Metastatic Tumour	-	-	Krukenberg tumour (2) Adenocarcinoma (1)	3	2.14
Total	**108**	**5**	**27**	**140**	**100**

epithelial tumours, whether benign or malignant (92/140; 65.71%). Our finding is closer the observation made in several other studies i.e. 64%, 66%, 70% respectively.[6,16,17] However, Guppy at al[18] documented a higher incidence of epithelial of epithelial tumours than in our study i.e. 90% and no borderline tumour was found in Ameena A et al study[19] which were five in number in our study. Germ cell tumours in our study were 22.86%. This value is quite low as compared to Western data[20] and data collected from other parts of India.[13-15] This difference may be due to sample size but genetic, socioeconomical and environmental factors may also be involved. The frequency of sex-cord-stromal tumours in our study was 9.29%. This value is quite high with other studies carried out in the west[21] and other parts of India.[13-15]

Our study showed that serous tumours (whether benign or malignant) were more common than mucinous tumours (65/140 vs 21/140 cases). This finding is correlates with other studies.[22,23] The studies carried out by Nalini G et al and Maheshwari et al also observed serous cystadenoma to be the commonest tumours. The frequency of malignant tumours in our study was highest for serous cystadenocarcinoma (11/140), correlates with many other studies.[6,13-15] However study conducted by Yasmeen et al shows endometrioid carcinoma to be more prevalent.[24]

Germ cell tumours comprise the second largest group in our study in which benign tumour dominated the malignant ones (30 vs 02/32). Among the benign Germ cell tumours, our study showed the highest incidence of dermoid cyst (26/32). A study conducted by Thanikasalanm et al[25] in India also documents dermoid cysts to be the commonest Germ cell tumours, whereas study concluded by Ahmed et al[6] in Pakistan also shows dermoid cyst to be the predominant Germ cell tumour.

Sex cord stromal tumours were the least common and quite high in our study, next to metastatic tumours (13/140; 9.29%). The incidence of these tumours is variable in other studies.[6,13-15] Zahra[25] found only 1% Sex cord stromal tumours in their study. Granulosa cell tumour were the commonest Sex cord stromal tumours in our study (11/13) while studies carried out by Yasmeen et al[24] and R Zha et al[25] mentioned a variable incidence of 28.5% and 6.62% respectively.

Conclusion

According to this study ovarian tumours are common in age group of 21 to 40 years. Non-neoplastic lesions are more common than neoplastic lesions. Luteal cyst is the commonest non-neoplastic lesion. Among the histological types of neoplastic lesions, surface epithelial tumours are predominant type, followed by germ cell tumours. The commonest benign tumour is serous cystadenoma and commonest malignant tumour is serous cystadenocarcinoma. This study is institutional based, therefore the results obtained may or may not reflect the actual histological pattern of ovarian tumours in Indian women. Therefore, multicentric study with larger sample size should be carried out.

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References

1. Parkin DM, Whelan SL, Ferlay J, Raymond L, Young J. Cancer Incidence in Five Continents 1997. VII. Lyon France: International Agency for Research on Cancer & International Association of Cancer Registries; IARC Scientific Publications No. 143. 1997.
2. Pisani P. Burden of cancer in developing countries. IARC Scientific Pub. 1994; 129: 31-9.
3. Parkin DM, Pisani P, Farlay J. Estimates of worldwide incidence of 18 major cancers in 1985. Int J Cancer. 1993; 54: 594-6.
4. Sen U, Sankaranarayanan R, Mandal S, Romana AV, Parkin DM, Siddique M. Cancer pattern in eastern India: the first report of Kolkata cancer registry. Int J Cancer. 2002; 100: 86-91.
5. Murthy NS, Shalini S, Suman G, Pruthvisinh S, Methew A. A changing trends in incidence of ovarian cancer-indian scenario. Asian Pac J

Cancer Prev. 2009; 10: 1025-30.
6. Ahmed Z, Kayani N, Hasan HS, Muzaffar S, Gill MS. Histopathological pattern of ovarian neoplasm. J Pak Med Assoc, 2000; 50: 416-9.
7. Kauff ND, Satagogan JM, Robsen ME, Offit K. Risk reducing salpingo-oophorectomy in women with a BRCA1 or BRCA2 mutation. N Engl J Med, 2002; 346: 1609-15.
8. Saadia Tariq, Rubina Sohail. Study of ovarian tumours in young girls. Professional Med J. 2011; 18(1): 41-5.
9. Shahin R, Ghulam S, Abid A. A clinicopathological study of ovarian cancer. Mothers Child. 1998; 36: 117-25.
10. Rieber A, Nussle K. Preoperative diagnosis of ovarian tumours with MR imaging, comparison with transvaginal sonography, positron emission tomography and histological findings. Am J Roentgenol. 2001; 177: 123-9.
11. Tavassoli FA, Devilee P. WHO. Classification of tumours. Pathology and Genetics. Tumours of Breast and Female Genital Organs. Lyon: IARC Press. 2003.
12. Aria M, Utsunomiya, Miki Y. Familial breast and ovarian cancers. Int J Clin Oncol, 2004; 9: 270-82.
13. Gupta N, Bisht D, Agarwal A, Veena KS. Retrospective and Prospective study of ovarian tumors and tumor like lesions, Dept. Of pathology & Microbiology, L.L.R.M. Medical college, Meerut. Indian J Pathol Microbiol. 2007; 50(3): 525-27.
14. Maheshwari V, Tyagi SP, Saxena K, Tyagi N, Sharma R, Aziz M, Hameed F. Surface Epithelial tumors of the ovary. Indian J Pathol Microbiol. 1994; 37(1): 75-85.
15. Mukerjee, Dasgupta A, Ghosh R Sengupta J. Study of Ovarian tumors. J of Obstet and Gynecol. 1991;26(3):691-96.
16. Getphol ED, Darnal HK. Pattern of ovarian neoplasm in Manipur. J Ind Med Assoc, 1990; 88: 338-9.
17. Tyagi SP, Maheshwari V, Tyagi N, et al. Solif tumours of ovary. J Ind Med Assoc, 1993; 91: 227-30.
18. Guppy AE, Nathan PD, Rust Gj. Epithelial ovarian cancer: A review of current management. Clin oncol (R coll Radiol). 2005; 17: 399-411.
19. Ameena A. et al. The relative frequency and histopathological pattern of ovarian masses. Biomedica. 2012; 28: 98-102.
20. Jacob IJ, Menon U. Progress and challenges in screening forn early detection of ovarian cancer. Mol Cell Proteomic. 2004; 3: 355-66.
21. Morrison J. Advances in the understanding and treatment of ovarian cancer. J Br Menopause Soc. 2005; 11: 66-71.
22. Yasmin S, Yasmin A, Asif M. Clinicopathological pattern of ovarian tumours in Peshawer region. J Ayub Med Coll Abbottabaad. 2008; 20 (4): 11-13.
23. Prabarker, Maingi K. Ovarian tumours- Prevalence in Punjab. Ind J Pathol Microbiol. 1989; 32: 276-81.
24. Yasmeen S, Yasmeen A. Frequency of benign and malignant ovarian tumours in a tertiary care hospital. J postgrad Med Inst. 2006; 20(4): 393-7.
25. Jha R, Karki S. Histological pattern of ovarian tumors and their age distribution. Nepal Med Coll J. 2008;10(2):81-85.

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