Research Article

A study on clinico-histopathological patterns of ovarian tumors

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ABSTRACT

Background: Ovarian tumors are an increasing cause for morbidity and mortality world over. The objective of this study was to study the distribution of ovarian tumors histopathologically in different age groups and their various clinical presentations.
Methods: Ninety eight patients who presented with 140 ovarian lesions on either or both sides were analyzed during a study period of one year and a further one year follow-up of patients with malignant tumors were done in a Tertiary teaching hospital.
Results: There were 140 lesions comprising of 40% of neoplastic lesions and 60% of non-neoplastic lesions. Among the ovarian neoplasms, 91.1% were benign lesions, 7.1% malignant and 1.8% were borderline malignant. Serous tumors were the commonest tumors (46.4%) followed by mucinous tumors and germ cell tumors (23.2% each). Endometriotic cysts (34.5%) were the commonest non-neoplastic lesions. The distribution of benign tumors in the reproductive age groups was only slightly more than that in the perimenopausal age group. All malignant tumors were in the perimenopausal age group. Menstrual complaints like irregular bleeding and menorrhagia formed the majority of clinical presentation. Bilaterality of lesions was seen in 16 patients.
Conclusions: Benign ovarian tumors are common in reproductive age group as well as perimenopausal age group. The most common neoplasm present was surface epithelial tumors - serous tumors followed by germ cell and mucinous tumors. The most common non-neoplastic lesions were endometriotic cysts and inclusion cysts. Bilateral involvement was uncommon with preponderance of lesions on the right side. Common clinical presentations were menstrual problems and abdominal pain.

Keywords: Ovarian neoplasm, Histopathology, Clinical presentation

INTRODUCTION

Ovarian masses are common forms of neoplasms in women and form some of the most challenging cases in Gynaecology. Ovarian tumors that present in the reproductive age group are mostly benign while about 30% in the postmenopausal age group are malignant.[1] They present themselves in various clinical forms and surprisingly many a time as vague, non-gynaecological complaints. Ovarian tumors also present in a wide spectrum of histopathological patterns. Many ovarian tumors are asymptomatic in the early stages and are unfortunately diagnosed in the advanced state. The high mortality rate of ovarian cancer is due to its late detection, thus earning itself the term "Silent Killer".[2]

Ninety percent of adnexal masses are detected by pelvic ultrasound.[3] This provides the clinician information about the origin of the adnexal mass. Further, details of the tumor like its complexity, its vascularity and consistency are made out on ultrasound imaging. The definitive diagnosis of the tumor however is by histopathological study.[4,5]

For a clinician, the practical method for screening for an adnexal mass is a bimanual pelvic examination done routinely in the outpatient department.[6] Tumor markers also help in the identification of ovarian masses. Adjunctive diagnostic techniques like MRI and CT help further in identifying metastasis of the tumor. Recent statistics in developed countries report better survival rates in patients with ovarian tumors; this being due to early detection and early appropriate treatment.[7]

METHODS

This study was done retrospectively in the department of Obstetrics and Gynaecology at Pushpagiri Institute of Medical Sciences and Research Centre, Tiruvalla, Kerala, South India. There were 98 patients with 140 ovarian masses on either or both sides who were admitted in the department during the period of 1 year (January - December 2014). The patients who underwent surgery for ovariotomy alone or along with hysterectomy were included in the study. Ovarian tumors managed conservatively were excluded from the study. Data regarding age, clinical symptoms, details of the mass like size, laterality, per-operative findings and histopathology were collected and statistically studied. Histopathological examination of the specimens was conducted by the department of Pathology of the hospital following appropriate staining (haematoxylin and eosin staining). The histopathological reports (HPR) were based on WHO classification of ovarian tumors. Follow-up of patients with malignant tumors were done post-operatively for a further period of one year. Percentages were calculated in each category and compared.

RESULTS

A total of 98 patients who presented with 140 ovarian masses on either and/or both sides formed the study group. Among the 140 lesions, there were 56 neoplastic tumors and 84 non-neoplastic lesions.

Among the neoplastic lesions, 91.1% (51/56) were benign, 7.1% (4/56) were malignant and there was only 1.8% (1/56) with borderline malignant histopathology. Maximum number of benign ovarian tumors was in the 21-40 year age group and a similar number in the 41-60 year age group. All the malignant tumors [100% (4/4)] were in the 41-60 year age group. Serous cyst adenomas (44.6%), followed by Germ Cell tumors (23.2%) and mucinous cyst adenoma (17.8%) were the most common benign tumors. The rest were 2 cases of Fibroma and 1 case of granulosa cell tumor. Of the 4 malignant tumors, 2 were mucinous cyst adenocarcinoma, 1 each of Serous cystadenocarcinoma and endometrioid adenocarcinoma. The borderline tumor belonged to the Mucinous group.

Among the non-neoplastic masses, commonest was endometriotic cyst 34.5% (29/84), followed by inclusion cysts 28.5% (24/84). Abnormal menstrual patterns followed by abdominal pain were the major presenting symptoms in these patients.

Among the malignant tumors, those that were diagnosed peroperatively as stage I (mucinous cystadenocarcinoma - 2) were managed with curative surgery. Another found as stage II b (serous cystadenocarcinoma) had surgery followed by six cycles of chemotherapy. At the end of one year follow-up, these patients are doing well. The case of endometrioid adenocarcinoma was lost to follow-up.

DISCUSSION

Developed countries show ovarian carcinoma as the cause of 30% of malignancies of the female genital tract.[8] In this study, out of 140 ovarian lesions, 96.4% were benign (135/140), 2.8% (4/140) were malignant and 0.7% (1/140) were borderline malignant tumor.

Table 1: Histopathological distribution of ovarian neoplasms.

Histopathology of tumors	No. of neoplasms	Percentages
Surface epithelial tumors	**40**	**71.4**
Serous tumor	**26**	**46.4**
Serous cyst adenoma	25	44.6
Serous cyst adenocarcinoma	1	1.8
Mucinous tumors	**13**	**23.2**
Mucinous cyst adenoma	10	17.8
Mucinous cyst adenocarcinoma	2	3.6
Borderline mucinous cyst adenocarcinoma	1	1.8
Endometrioid adenocarcinoma	**1**	**1.8**
Germ cell tumor	**13**	**23.2**
Benign cystic teratoma	12	21.4
Struma ovary	1	1.8
Sex cord stromal tumor	**3**	**5.3**
Fibroma	2	3.6
Granulosa cell tumor	1	1.8

(No. of Neoplastic lesions =56).
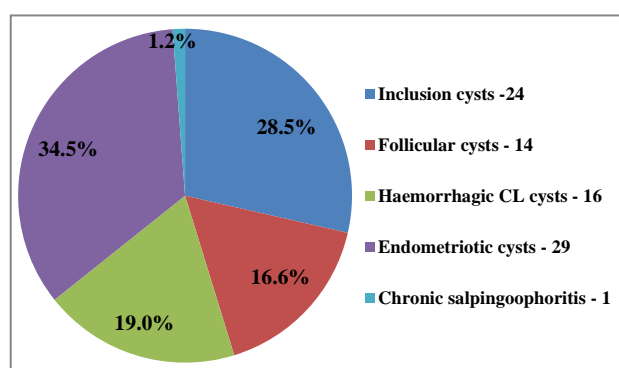
Figure 1: Distribution of non-neoplastic lesions (n=84).

Ovarian tumors show histological heterogeneity. The WHO classification of ovarian tumors is based on the tissue of origin - epithelial, germ cell tumors, sex cord stromal tumors.[8] It is globally seen that, surface epithelial tumors are the most common ones.[1] This study also is in favour of that observation (Table 1). Epithelial tumors formed 71.4% (40/56) the main bulk of neoplasms observed in the study. The majority of epithelial tumors were serous tumors (46.4%) and mucinous and germ cell tumors (23.2% each). Among serous tumors, serous cyst adenoma constituted 44.6% and serous cyst adenocarcinoma was 1.8%. Among mucinous tumors, 17.8% were cyst adenoma, 3.6% were cyst adenocarcinomas and 1.8% with borderline pathology. There was one patient who was diagnosed to have endometrioid adenocarcinoma. Among the germ cell tumors, all were benign cystic teratomas with one having a predominance of thyroid tissue (struma ovary).

Table 2: Distribution of ovarian masses in different age groups.

Age (in years) n=124*	Neoplasms							Non Neoplasms					
	Serous tumors		Mucinous tumors			Germ cell tumor	Endometrioid adenoca	Sex cord tumor	Inclusion cyst	Follicular cyst	Endometriotic cyst	C luteum cyst	Salpingoophoritis
	B	M	B	BL	M								
<20	1	-	-	-	-	1	–	–	2	–	–	2	–
21-40	7	-	6	1	-	7	–	2	4	3	11	3	–
41-60	11	1	3	-	2	4	1	1	14	10	11	9	1
>60	3	-	-	-	-	1	–	–	1	–	1	–	–

B= Benign; M= Malignant; BL= Borderline; * Frequency of occurance in an age-group taken as 1 in individuals with the same lesion bilaterally.

The frequency of distribution of ovarian tumors in the present study was similar to that as reported by Swami G G et al. They reported an incidence of 61.6% of epithelial tumors and 21.7% of germ cell tumors.[9] This was in concordance with the study by Mondal who reported surface epithelial tumors to be the most common (67.9%) and germ cell tumors (23.1%).[10] Gupta N and Ahmad Z reported similar high incidences - 98.8% and 63.5% respectively, in their studies.[11,12] Thanikasalam who conducted a study among Asian population reported the most common ovarian neoplasm among Indians to be Serous cystadenoma and Teratomas among the Malay and Chinese.[13] Among the non-neoplastic lesions, 34.5% were endometriotic ovarian cysts, thus explaining the predominant complaint of menstrual problems at presentation. A similar high incidence of ovarian endometriosis (45.9%) was observed by Al-Fozan H and Tulandi T.[14] Contradicting this were studies by Gupta N and Carey M who reported low incidences.[11,15]

In this study (Table 2), benign tumors were more in the reproductive age group (21-40 years). A similar number of benign tumors were also seen in the perimenopausal group (41-60 years). All 4 patients diagnosed with malignant ovarian tumors were in the older group (41-60 years). The single borderline tumor was present in the younger group (21-40 years). Manivasakan J observed an equal distribution of benign ovarian tumors in the reproductive and perimenopausal age groups.[16] Sharadha SO noted maximum number of neoplasms 89.9% in the reproductive age group which was comparable to that reported by Ashraf A et al.[17,18] On the contrary, Ashraf's study reported a high percent (71.4%) of malignant tumors in the reproductive age group. Most of available literature from the western world report ovarian cancer to be more in the elderly perimenopausal women.[19,20] Studies from India and Pakistan found the occurrence of ovarian tumors to be unusual before the age of 40 years.[21,22] Germ cell tumors 53.8% (7/13) were more in the 21-40 year group and not as expected in the adolescent group. Surface Epithelial Tumors (SET) were there in both reproductive and perimenopausal age groups.[21,22] Endometriotic cysts and inclusion cysts were more in the 40-60 year group. These findings were comparable to that of Mankar.[23]

Common clinical presentations in this study for both neoplastic and non-neoplastic lesions were menstrual complaints (Figure 2). Menstrual problems common in the reproductive age groups like irregular bleeding, menorrhagia, and dysmenorrhoea was reported by 27 patients and 6 complained of post-menopausal bleeding. Endometriotic lesions (34.5%) could have attributed to this uncommon complaint in ovarian masses. Patient with endometrioid adenocarcinoma also presented with bleeding irregularities. A good number of ovarian masses

were diagnosed incidentally - during histopathological examination of hysterectomy and salpingoophorectomy specimens. Three pregnant women were diagnosed as having ovarian masses during routine antenatal ultrasound. Laparotomy done for a case of ruptured ectopic pregnancy showed associated endometriotic cyst. Abdominal pain and back pain were reported by 21 of our patients. Cause of this abdominal pain was due to torsion only in 2 patients. One patient had chronic salpingoophoritis and another case operated for an endometriotic cyst was found to have formed an abscess. Endometriotic ovarian cysts were seen in many of patients who presented with infertility (5.1%). Gastrointestinal symptoms like dyspepsia, nausea and vomiting, usually more in malignant tumors were present in both groups. The small number of malignant tumors in this study could be the reason for this discrepancy.
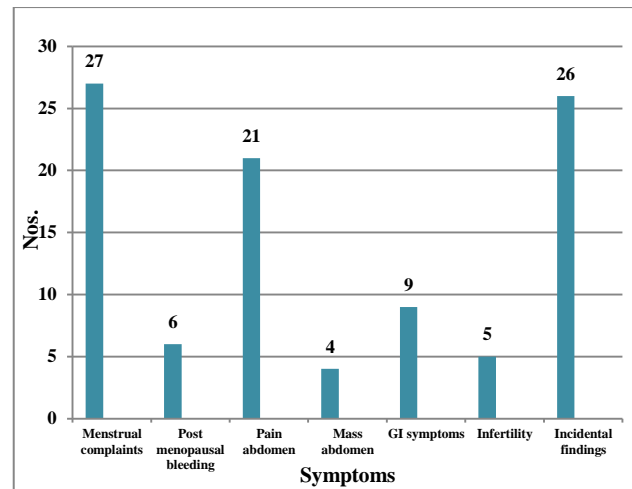
Figure 2: Clinical presentation of patients.

Patients have presented with more than one symptom.

Table 3: Distribution of laterality and size of ovarian lesions.

Ovarian tumors	Side			Size			
	Right	Left	Bilateral *	<4.9 cm	5-9.9 cm	10-14.9 cm	≥15 cm
Serous	13	7	3	6 (4.3)	16 (11.4)	4 (2.8)	-
Mucinous	8	3	1	2 (1.4)	3 (2.1)	4 (2.8)	4 (2.8)
Endometrioid adenocarcinoma	1	-	-	-	1 (0.7)	-	-
Germ cell	8	5	-	5 (3.6)	6 (4.3)	2 (1.4)	-
Sex cord stromal tumor	-	3	-	2 (1.4)	1 (0.7)	-	-
Inclusion cyst	13	5	3	20 (14.3)	4 (2.8)	-	-
Follicular cyst	7	5	1	14 (10.0)	-	-	-
Haemorrhagic corpus luteal cyst	5	7	2	15 (10.7)	1 (0.7)	-	-
Endometriotic cyst	8	9	6	17 (12.1)	9 (6.4)	1 (0.7)	2 (1.4)
Chronic salpingo-oophoritis	-	1	-	-	1 (0.7)	-	-
Total	**61**	**47**	**16**	**81**	**42**	**11**	**6**
	n= 124			n=140			

* Only lesions with the same histopathology on both sides have been included.

Mankar DV reported only 5% of menstrual abnormalities. However non-neoplastic lesions like endometriotic cysts were not taken into consideration.[23] He observed other common presentations of abdominal pain and lump. A notable fact was that abdominal pain was present equally in both malignant and benign groups. Interestingly, 43% of abdominal masses were associated with benign lesions.[23] Findings similar to our study regarding menstrual complaints and abdominal pain were seen by Kanthikar SN and Winter Jo TV.[24,25] Abdominal pain was seen to be associated with 90% ovarian tumors in certain studies which also reported 66% of abdominal masses to be associated with malignant ovarian tumors.

This study showed 16 cases of bilateral involvement of ovarian tumors with the same histopathology (Table 3). Majority of tumors were found to be on the right side. The low number of malignant ovarian tumors attributed to the decreased incidence of bilateral involvement of ovarian tumors in this present study. Studies conducted

by Mondal showed that bilateral ovarian tumors were usually malignant in nature. Bilaterality was seen in 49.5% of malignant serous tumors and 28.1% of mucinous tumors.[10] Literature from Nepal shows that bilateral occurence of ovarian masses was a rare finding in their population.[16,26] Size of the ovarian masses in our study ranged from 1 cm to the largest being 22.5 cm (Table 3). Most of the masses less than 5 cm were non-neoplastic lesions and the large ones (>15 cm) belonged to the mucinous and endometriotic lesions.

CONCLUSION

Benign ovarian neoplasms were seen similarly in both reproductive and perimenopausal age groups. Malignant tumors were all in the postmenopausal group. Based on histopathology, most common neoplasm was surface epithelial tumors - serous tumors, then mucinous and germ cell tumors. Most common non-neoplastic lesion was endometriotic cysts. Ovarian masses were more on the right side with only few showing bilateral involvement. Menstrual problems and abdominal pain were the common clinical presentation seen. Differentiation of a benign tumor from a malignant one is important for determining management and prognosis; hence further similar studies are warranted.

ACKNOWLEDGEMENTS

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