



Original Article

Spectrum of ovarian tumors in a referral hospital in Nepal

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ABSTRACT

Background: Ovarian tumors are common forms of neoplasia in women. Among cancers of the female genital tract, it ranks only below carcinoma of the cervix and the endometrium, but is responsible for approximately 50% of the deaths. They arise from different cell lineages and hence constitute a wide variety of neoplastic entities with diverse morphological and clinical manifestations.

Materials and Methods: A descriptive study of 363 cases of ovarian tumors was carried out during a three year period from January 2011 to December 2013.

Results: Of the 363 ovarian tumors, 293 (80.72%) cases were benign, 57 (15.70%) were malignant and 13 (3.58%) were borderline. Germ cell tumour was the most common class of tumour and seen in 187 (51.52%) cases, followed by surface epithelial in 158 (43.53%) cases. The age distribution of the patients ranged from 10-82 years with a median age of 33 years. Benign tumors were more common than malignant ones in all age groups.

Conclusion: Most of the ovarian tumors in this study were of germ cell origin. The incidence of malignant germ cell tumors was also significantly higher than in other studies. Mature cystic teratoma was the most common benign tumour while serous carcinoma was the most common malignancy. The incidence of malignant germ cell tumors was higher compared to other studies.

INTRODUCTION

Ovarian tumors are common forms of neoplasia in women.¹ They arise from different cell lineages and hence constitute a wide variety of neoplastic entities with diverse morphological and clinical manifestations. Ovarian cancer

accounts for 15-25% of all gynaecological malignancies, yet it is responsible for approximately 50% of the deaths.^{2,3} Among cancers of the female genital tract, the incidence of ovarian cancer ranks only below carcinoma of the cervix and the endometrium.⁴ As early ovarian cancer is not associated with significant symptoms, most women present with advanced disease.^{5,6} The recognition of the various histological patterns is important for correct diagnosis, which has important implications for treatment and prognosis.

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The present study was undertaken so as to find out the frequency of different histological types of ovarian tumors which are prevalent in this part of the country and to see whether they are significantly different from other populations.

MATERIALS AND METHODS

This is a descriptive study conducted in the department of pathology, Patan Academy of Health Sciences from January 2011 to December 2013. This study included all consecutive cases of ovarian tumors reported in the Department of Pathology over a three year period were included in the study. Tumour-like conditions were excluded from the study. The tumors were classified according to the World Health Organization classification of ovarian tumors.⁷ Statistical analyses were done by statistical package for social sciences (SPSS) version 17.

RESULTS

A total of 363 ovarian tumors were diagnosed in the three year period. Amongst them, 293 (80.72%) were benign, 13 (3.58%) were borderline while 57 (15.70%) were malignant. Germ cell tumour was the most common class of tumor and seen in 187 (51.52%) cases, followed by surface epithelial 158 (43.53%) tumors (Table 1).

Table 1: Frequency of different classes of ovarian tumors

Class of tumor	No.	%
Germ cell tumour	187	51.52
Surface epithelial tumour	158	43.53
Sex cord-stromal tumour	12	3.30
Secondary (metastatic) tumour	6	1.65
Total	363	100

Of the 293 benign tumors, 169 (57.68%) were germ cell tumors while 117 (39.93%) were surface epithelial tumors. Out of the 57 malignant tumors, 28 (49.12%) were surface epithelial tumors while 18 (31.58%) were of germ cell origin (Table 2).

Out of the 158 surface epithelial tumors, 117 (74%) were benign, 13 (8.23%) were borderline whereas 28 (17.72%) were malignant. Most of these tumors were of serous and mucinous origin and were seen in 92 (58.23%) and 57 (36.08%) cases, respectively (Table 2).

Out of the 187 germ cell tumors, 169 (90.37%) were benign, most being mature cystic teratomas (98.82%). Immature teratoma was the commonest germ cell malignancy and seen in 9 (50%) cases.

Table 2: Histological pattern of ovarian tumors

Diagnosis	Benign	Borderline	Malignant	Total
Surface Epithelial Tumour	117	13	28	158
Serous tumour	72	3	17	92
Mucinous tumour	42	10	5	57
Endometrioid tumour	-	-	4	4
Malignant mixed mullerian tumour	-	-	2	2
Brenner tumour	1	-	-	1
Mixed epithelial tumour	2	-	-	2
Sex Cord-Stromal Tumour	7	-	5	12
Adult granulosa cell tumour	-	-	4	4
Juvenile granulosa cell tumour	-	-	1	1
Fibroma	5	-	-	5
Thecoma	1	-	-	1
Sclerosing stromal tumour	1	-	-	1
Germ Cell Tumour	169	-	18	187
Dysgerminoma	-	-	2	2
Yolk sac tumour	-	-	2	2
Mature cystic teratoma	167	-	-	167
Struma ovarii	2	-	-	2
Immature teratoma	-	-	9	9
SCC arising from a dermoid cyst	-	-	3	3
Malignant mixed germ cell tumour	-	-	2	2
Secondary (metastatic) tumour	-	-	6	6
Grand Total	293	13	57	363

Table 3: Frequency of different classes of ovarian tumors in different age groups

Classes of tumors	Total	Types	< 20	20-29	30-39	40-49	50-59	≥ 60	Total
Surface epithelial (n= 158)	158	Benign	5	27	31	20	18	16	117
		Borderline	-	-	5	3	3	2	13
		Malignant	2	3	3	6	10	4	28
Sex cord-stromal (n = 12)	12	Benign	-	2	1	-	3	1	7
		Malignant	-	3	-	2	-	-	5
Germ cell (n = 187)	187	Benign	12	69	54	21	9	4	169
		Malignant	3	8	3	2	1	1	18
Secondary (n = 6)	6	Malignant	-	1	2	1	2	-	6
Total	363		22	113	99	55	46	28	363

Table 4: Unilateral and bilateral distribution of ovarian tumors

Tumour Type	Diagnosis	U/L	B/L	Total
Benign	Serous cystadenoma	68	4	72
	Mucinous cystadenoma	40	2	42
	Brenner tumour	1	-	1
	Mixed epithelial tumours	2	-	2
	Fibroma	5	-	5
	Thecoma	1	-	1
	Sclerosing stromal tumour	1	-	1
	Mature cystic teratoma	150	17	167
	Struma ovarii	2	-	2
	Total		270	23
Borderline	Borderline serous tumour	3	-	3
	Borderline mucinous tumour	10	-	10
Total		13	-	13
Malignant	Serous cystadenocarcinoma	11	6	17
	Mucinous cystadenocarcinoma	3	2	5
	Endometrioid carcinoma	1	3	4
	Malignant mixed mullerian tumour	1	1	2
	Adult granulosa cell tumour	4	-	4
	Juvenile granulosa cell tumour	1	-	1
	Dysgerminoma	2	-	2
	Yolk sac tumour	2	-	2
	Immature teratoma	9	-	9
	SCC arising from a dermoid cyst	3	-	3
	Malignant mixed germ cell tumour	1	1	2
	Secondary (metastatic) tumors	1	5	6
Total		39	18	57

Amongst the 12 sex-cord stromal tumors, 7 (58.33%) were benign and 5 (41.67%) malignant (Table 2). Overall, mature cystic teratoma was the most common benign tumour and was seen in 167/293 (57%) cases. Mucinous borderline tumour was more prevalent in the borderline category and seen in 10/13 (76.92%) cases. Serous carcinoma was the most common malignancy and seen in 17/57 (29.82%)

patients (Table 2).

The age distribution of the patients for all tumors ranged from 10-82 years with a median age of 33 years. Similarly, the median age for benign tumors was 32 years, while for borderline and malignant tumors it was 47 and 40 years, respectively. Approximately, 212(58.40%) tumors were

seen in the 20-40 year age group. Benign tumors were more common than malignancies in all age groups. Most benign tumors (68.60%) were diagnosed in the 3rd and 4th decades of life, whereas most malignant tumors (50.88%) were seen after the 4th decade, with the exception of malignant germ cell tumors which were mostly seen below the age of 30 (77.78%). Borderline tumors were only seen after the age of 30 (Table 3).

Up to the 1st four decades, germ cell tumour was the predominant class of tumour and was seen in 149/234 (63.68%) cases. Both benign and malignant germ cell tumors were more prevalent in the 20-29 year age group and were seen in 69/169 (40.83%) and 8/18 (44.44%) cases, respectively. Also, amongst the 5 malignancies seen below the age of 20, 3 (60%) cases were of germ cell origin (Table 3).

From the 4th decade onwards, surface epithelial tumors were more common and seen in 82/129 (63.57%) cases. Twenty (71.43%) cases of malignant surface epithelial tumors were seen after the 4th decade, of which 11 (55%) cases were serous carcinomas. Out of the 12 sex cord-stromal tumors, 5 (41.67%) were seen in the 20-29 age group. All 6 secondary (metastatic) tumors occurred after the 2nd decade and were almost evenly distributed amongst the other age groups (Table 3).

Out of the 363 ovarian tumors, 41 (11.29%) cases were bilaterally involved by the tumour. It was observed in 31.58% (18 cases) malignant tumors compared to just 7.85% (23 cases) in benign tumors. Most of the secondary (metastatic) tumors (83.33%) and endometrioid carcinomas (75%) were bilateral. All 13 borderline tumors were unilateral (Table 4).

DISCUSSION

In this study, 80.72% (n=292) of the ovarian tumors were benign. This is similar to data from the west and the subcontinent, including Nepal.^{4,8-12} The frequency of borderline and malignant tumors in the subcontinent was variable from 0.72 to 4.33% and 9.5 to 30.96%,⁹⁻¹⁶ respectively. In our study, mature cystic teratoma was the most common benign tumour (57%) where as serous carcinoma was the commonest malignancy (29.82%). Similar findings were reported in other studies.^{9,10,17,18}

Germ cell tumors constitute 15-30% of all ovarian tumors.^{1,17} However, in one North American study, the figure was surprisingly high 58%.¹⁸ Similar high incidence of 51.52% was also observed in our study. About 95% of these tumors are benign (predominantly mature cystic teratomas)^{9,10,17,18} while the incidence of malignant ovarian germ cell tumors ranges from 1 to 6% as reported in the west^{1,7,19,20} and from 5 to 20% in Asia.^{9,11,21-24} In our study, the incidence

of benign germ cell tumors was similar to the numbers reported elsewhere. However, the incidence of germ cell malignancies was much higher accounting for 31.58% of all ovarian cancers.

In the western literature, surface epithelial tumors account for 50 to 55% of all ovarian tumors while their malignant counterparts comprise approximately 90% of all ovarian cancers.^{17,18} Data from similar studies in Japan and Nepal show that 46 to 52% of ovarian tumors are surface epithelial in origin, where as their malignancies account for 69 to 75% of all ovarian cancers.^{8-10,21,25} However, in our study both these figures were much lower (43.53% and 49.12%, respectively). In the subcontinent, the corresponding figures varied from 61.6 to 90% and 67.44 to 85.71%, respectively.^{6,11,13,14}

Serous tumors constitute about 30% of all ovarian tumors, of which approximately 60% are benign, 10% borderline while 30% are malignant.^{4,17,18} In our study, serous tumors accounted for 25.34% of all ovarian tumors. This figure varied from 32.35% to 50.8% in other studies.^{9,10,13} In our study, 78.26% of the serous tumors were benign, 3.26% borderline and 18.48% malignant.

Likewise, mucinous tumors account for 12 to 25% of all ovarian tumors, which is similar to our (15.70%) and other studies from the subcontinent.^{9,10,13} Approximately 75% of these tumors are benign, 10% borderline and 15% are malignant.^{4,17,18} In our study, 73.69% of these tumors were benign, 17.54 % were borderline and only 8.77% cases were malignant.

In the literature, 5-12% of all ovarian tumors are sex cord stromal tumors^{17,18} and 7-12.5% are secondary tumors.²⁶ In our study, sex cord stromal and secondary (metastatic) tumors accounted for only 3.3% and 1.65%, respectively. According to Scully et al,⁸ approximately 70% of the secondary (metastatic) tumors are bilateral, where as it was 83.33% in our study.

In agreement with other studies, most ovarian tumors were seen in the reproductive age group, between 20-40 years.^{9,11} Benign tumors of all were seen in all age groups. Malignant surface epithelial tumors occurred mostly after the 4th decade. Similar observations were also made in other studies.⁸⁻¹⁰ In patients under the age of 21 years, approximately 60% of the ovarian tumors are of germ cell origin, and as many as one third of germ cell tumors are malignant, accounting for two thirds of ovarian cancers in the first two decades.²⁷ In our study, 68.18% of the tumors seen in this age group were of germ cell origin and 20% of these germ cell tumors were malignant.

CONCLUSION

In our study, most of the tumors were of germ cell origin. The incidence of malignant germ cell tumors was higher than in other studies. Mature cystic teratoma was the most common benign tumour while serous carcinoma was the commonest malignancy. Benign tumors were more common than malignancies in all age groups. Malignant surface epithelial tumors were mostly seen after the 4th decade while malignant germ cell tumors were observed in a younger age group.

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