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RESEARCH ARTICLE

Disease Characteristics and Outcome of Malignant Ovarian Germ Cell Tumors in a Tertiary Care Centre of India

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ABSTRACT

Aims and Objectives: To study the demographic profile, disease characteristics and outcome of malignant ovarian germ cell tumors

Material & Methods: This retrospective study was conducted on 50 cases of malignant ovarian germ cell tumors (MOGCT) diagnosed over a period of five years in a tertiary care teaching hospital. Institutional ethical clearance was obtained and informed consent was taken from all participants. The case records were reached for demographic, clinical, investigational and treatment details. Patients were contacted telephonically to know their current health status. Data was tabulated and analysed to find the overall survival, recurrence and disease free survival.

Results: The median age at diagnosis was 21 years. The most common presenting symptom was abdominal pain or pressure reported in 54% cases. Majority (72%) of cases presented in stage I and 40% underwent fertility preservation surgery with unilateral oophorectomy. About 20 % cases underwent primary cytoreductive surgery and 8% received neoadjuvant chemotherapy followed by interval cytoreductive surgery. The most common histopathological types were dysgerminoma (40%) and mixed germ cell tumor (35%). Out of 50 cases, survival outcomes were available for 37 cases. The median follow up duration was 30.4 month. The 3 year overall survival was 100% and disease free survival was 92%. Recurrence was seen in 12% cases. Two cases had a favourable fertility outcome after treatment.

Conclusions: MOGCT is a disease of young women of reproductive age group with a good survival & fertility outcome with standard treatment protocols.

KEYWORDS
Dysgerminoma, Yolk sac tumor, Cytoreductive surgery, Ovarian cancer, Adolescents and Young adults

INTRODUCTION

Ovarian germ cell tumors (OGCTs) represent 20 to 25% of all ovarian neoplasms, whereas malignant ovarian germ cell tumors (MOGCTs) comprise only 5% of all malignant ovarian tumors. MOGCTs show a peak prevalence in young women and adolescents. In the first two decades of life, almost 70% of ovarian tumors are of germ cell origin, and one-third of these are malignant. In contrast to the relatively slow-growing epithelial ovarian tumors, germ cell malignancies grow rapidly. These tumors also differ from epithelial ovarian tumors for their unilateral localisation (95% of cases), a rare tendency to spread and for their good prognosis. The good prognosis is explained by the high diagnostic rate at an early stage and high chemosensitivity. The common types of malignant germ cell tumors are dysgerminomas, immature teratomas, and endodermal sinus tumors in order of prevalence. Surgery is the mainstay of treatment and preservation of fertility is the standard of care in all eligible patients. The most effective adjuvant chemotherapy is bleomycin, etoposide, and cisplatin (BEP) which is given for 3- 4 cycles. Patients are followed up with clinical examination, imaging and and tumor markers every 2 to 3 months for the first 2 years, 6 monthly up to 5 years and annually thereafter. A variable long term survival rate of 82 to 100% is reported in the literature in the early stages and 75% in the advanced stages

Since there is a paucity of data about disease characterisation and survival outcomes from Indian centres, hence this retrospective study was conducted at our centre.

MATERIAL AND METHODS

This retrospective study included 50 cases of MOGCT diagnosed over five years between July 2017 – June 2022 in a tertiary care teaching hospital of India. Ethical clearance was obtained from Institutional ethics committee. Informed consent was taken from all cases recruited in the study.

The cases were identified and case records were searched from the record section for documentation of demographic, clinical and treatment details. This included clinical presentation, investigations, surgical procedure, histopathological finding, chemotherapy received and any recurrence. All recruited patients were called telephonically to know the current health status. All data was tabulated and analysed. Only 37 out of 50 cases could be contacted to know their current health status. Thus, overall survival and disease free survival were analysed for them.

RESULTS

Table1 shows demographic profile and disease characteristics of all cases.

Table 2 shows FIGO stage, histological type and surgical treatment details.

Table 3 shows overall survival and disease free survival.

Table 1: Demographic profile and disease characteristics of study cohort (n = 50)

Patient characteristics	*No.*	*Percentage*
Age (years)		
15–30	29	58
31–45	14	28
46–60	7	14
Median age -22		
Marital status		
Married	10	20
Unmarried	40	80
Parity		
Nulliparous	8	16
Multiparous	2	4
Residence		
Rural	14	28
Urban	36	72
Symptoms		
Abdominal pain	27	54
Abdominal distention	12	24
Abdominal lump	7	14
Asymptomatic	4	8
Size of the tumour		
<10 cm	12	24
>10 cm	38	76
Laterality		
Unilateral	34	68
Bilateral	16	32

Out of 37 cases with available follow up, two had a favourable fertility outcome

Table 4 shows the details of recurrence cases. The recurrence rate was 12% and median follow up duration for these six cases was 30.4 months. The median time of recurrence was 36 months.

DISCUSSION

More than two-third of ovarian germ cell tumors diagnosed before the age of 20 years are malignant. MOGCTs are rare tumours, mainly affecting the reproductive age groups where fertility sparing surgery plays a vital role MOGCT is more common in adolescents and younger age adults. The incidence reported in Asians is around 15% which is relatively higher than that reported in western world.[1] Patients in current study had demographic and clinical features similar to those reported in other series, as regards age, histologic subtype and primary tumour site. The median age of diagnosis in this study was 20 years, which was similar to other studies from India.[2]

The most common presenting symptom among our patients was abdominal pain which is similar to the other studies.[2,3] Dysgerminoma was the most commonly reported histology comprising 40% of total cases, which was in accordance with most of available studies except few where they reported mixed germ cell tumour as most common[2] and immature teratoma as the commonest.[4] Forty percent of our patients were diagnosed in Stage 1c and this was similar to various studies.[2,4] However Lakshmanan *et al*[6] and Topuz et al[5] have reported that most common stage at diagnosis was stage III and IA, respectively. These differences may be due to the referral policies adapted at various centres.

Table 2: Distribution of cases according to surgical procedures, FIGO stage and histopathologic type

S.No		*Distribution (n)*	*(%)*
1.	**Surgical procedure**		
	Unilateral oophorectomy	16	32
	with total omentectomy with peritoneal biopsy)	20	40
	Unilateral salpingoophorectomy	10	20
	NACT (BEP) f/b IDS PDS f/b adj CT (BEP)	04	08
2.	**FIGO stage**		
	IA	16	32
	IC	20	40
	IIA	06	12
	IIIC	08	16
3.	**Histopathologic type**		
	Dysgerminoma	20	40
	Mixed germ cell tumor	18	36
	immature teratoma	05	10
	yolk sac tunor	05	10
	embryonal cell carcinoma	02	04
	sex cord tumor	01	02

Table 3: Follow-up duration, overall survival and disease free survival

Follow up duration (years)	*No. of cases*	*Recurrence*	*OS (%)*	*DFS (%)*
< 1 year	8	0	100	100
1–3 year	13	4	100	69.2
>3 year	28	2	100	92.8
Mean follow-up duration	40 months (3 year 4 months)			

Table 4: Disease characteristics, treatment and outcome of recurrence cases (n=6)

HPE	*Stage*	*treatment*	*Treatment of recurrence*	*Overall survival*	*Disease free survival*
Immature teratoma	1c	Unilateral oopherectomy	Completion surgery	34 months	27 months
Immature teratoma	3c	Unilateral oophorectomy	Completion sx	29 months	21 months
Immature teratoma	1c	Completion sx	Secondary cytoreductive sx	40 months	22 months
Embryonal carcinoma	2b	Completion sx	Secondary cytoreductive sx	40 months	22 months
Embryonal carcinoma	2b	Completion sx	Secondary cytoreductive sx	29 months	18 months
Mixed germ cell tumor	3c	Completion sx	Secondary cytoreductive sx	26 months	20 months
Mean survival duration				33 months	21.6 months

MOGCT may have different surgical treatment approaches according to their stage of presentation. Fertility sparing surgery (FSS) plays vital role in early stage disease treatment as was the scenario in our cohort. Almost three fourth of patients underwent FSS which was more than other studies. Lakshmanan *et al.*[6] reported fertility sparing surgery in 36.8% of their cases due to higher proportion of stage III disaese. Literature have approved this especially in early stages as a safe conservative modality and in advanced stages the literature reports a non-compromised OS and DFS. Nevertheless, considering the rarity of advanced stage (20–30%) and few cases treated conservatively, the safety of FSS is accepted but not yet fully clinically supported. Therefore conservative surgery for MOGCTs in advanced stages needs a larger number of cases and meta-analysis for validation.

Advanced stage MOGCT surgery was accompanied with omentectomy as a part of staging laparotomy in about 32% patients in our study. However, these being highly chemo-sensitive tumours have shown negligible survival benefit which underlines its role questionable.[7,8]

Most common chemotherapeutic regimen used was BEP. Bleomycin being known for pulmonary fibrosis as a common side-effect; therefore all patients were screened with pulmonary function test prior to its administration. Three and four cycles were given for FIGO stage 1 and FIGO 2 and above, respectively. The higher survival rate in our study was in concordance with other studies due to adherence to standard treatment protocols, high chemo-sensitivity and early stage presentation.[4] The most common side-effect reported in our study was febrile neutropenia which is similar to findings of Talukdar *et al*,[9] The recurrences rate reported in our study is low and comparable to other studies which indicates a good therapeutic response and favourable prognosis of patients in the early stages.

The overall three year survival was 100% and DFS was 81% with median follow up of three and a half year. Most of the available literature reports that 5 year overall survival and disease free survival for MOGCT are around 80%.[2,4,10] The shortcoming of our study is that the follow up duration of five years is available in few cases only hence five year survival could not be calculated. This can definitely be achieved with close surveillance and long term follow up studies which need to be conducted in future.

CONCLUSION

The disease characteristics and treatment outcomes of MOGCT in our centre are comparable to the international literature. The survival outcomes are also encouraging with need for better surveillance and long duration follow up.

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