Outcomes of pediatric and adolescent girls with Malignant Ovarian Germ cell tumors after Chemotherapy and Surgery: A Single Institutional Experience

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OBJECTIVE

- Malignant ovarian germ cell tumors are rare and vital cancers in the pediatric age group of females, affecting 1-2% of all ovarian malignancies.
- Advances in surgical management, chemotherapy, and patient care have significantly improved survival.
- The study focuses on patterns of care, survival rates, recurrence, and complications associated with therapy.

METHODS

- This retrospective study investigates the treatment outcomes of 116 pediatric patients diagnosed with malignant ovarian germ cell tumors at a tertiary care center in Pakistan between 1999 and 2022.
- The median age was 13.5 years, with a predominance of dysgerminomas (38.7%).
- The five-year event-free survival (EFS) and overall survival (OS) were 87.1% and 90.5%, respectively.
- Histology, chemotherapy regimen, and risk group classification were key factors influencing survival, with dysgerminoma showing the best prognosis.
- In patients whose tumor markers normalized rapidly, there was better event-free survival (EFS). Relapsed disease was observed in 2.6% of patients, while disease progression occurred in 7.8% of patients.

Table1 Staging and risk stratification

Stage	Features
I	Limited to the ovary (peritoneal evaluation should be negative). There is no evidence of disease beyond the ovaries. (Note: The presence of gliomatosis peritonei does not result in changing Stage I disease to a higher stage.)
II	Microscopic residual; peritoneal evaluation negative. (Note: The gliomatosis peritonei does not change Stage II disease to a higher stage. Tumor markers normalize or decrease with an appropriate half-life.
III	Lymph node involvement (metastatic nodule); gross residual or biopsy only; contiguous visceral involvement (omentum, intestine, bladder); peritoneal evaluation positive for malignancy.
IV	Distant metastases, including the liver.
Risk	**Features**
Low	Gonadal Stage 1 tumors (regardless of AFP (Alpha fetoprotein) level if secreting).
Intermediate	Pure germinoma, Stage 2, 3, or 4, Pure HCG (Human chorionic gonadotrophin) secreting tumors, Stage 2 or 3
High Risk	All Stage 4 tumors > 10,000 k U/L

TREATMENT

Most patients had upfront surgery (87.9%) followed by adjuvant chemotherapy, which includes JEB (Carboplatin, etoposide, Bleomycin) (64.7%), BEP (Bleomycin, etoposide, cisplatin) (25.0%), and PEB (cisplatin, Etoposide, Bleomycin) (4.3%) regimens.

Table 2:Patient characteristics and demographics

Characteristics	n = 116
Median age at diagnosis	13.5 years (10-17)
<11 years	20(17.24%)
>11 years	94 (81.0%)
Histology	
Dysgerminoma	45 (38.7%)
Embryonal carcinoma	5 (4.3%)
Yolk Sac Tumour	34 (29.3%)
Mixed Germ Cell Tumour	32 (27.6%)
Stage	
I	13 (11.2%)
II	10 (8.6%)
III	56 (48.3%)
IV	37 (31.9%)
AFP (Alpha feto protein)	
<10	43 (37.1%)
10-100	10(8.6%)
100-1000	14(12.1%)
>1000	49 (42.2%)
Surgery	
Upfront surgery only	102 (87.9%),
Delayed surgery + salvage surgery	22 (12.1%)
Risk group	
Low	16(13.8%)
Intermediate	43(37.1%)
High	57(49.1%)
First-line chemotherapy	
JEB (Carboplatin, etoposide, bleomycin)	75 (64.7%)
BEP (bleomycin, etoposide, cisplatin)	29 (25.0%)
PEB (cisplatin, Etoposide, Bleomycin)	5 (4.3%)
No chemotherapy	7 (6.03%)

RESULTS

The actual 5 years overall survival of the whole group was 90.5% (Figure 1 The actuarial 5 years event free survival of the whole group was 87.5% (Figure 2).

Fig 1: 5 Year Overall Survival

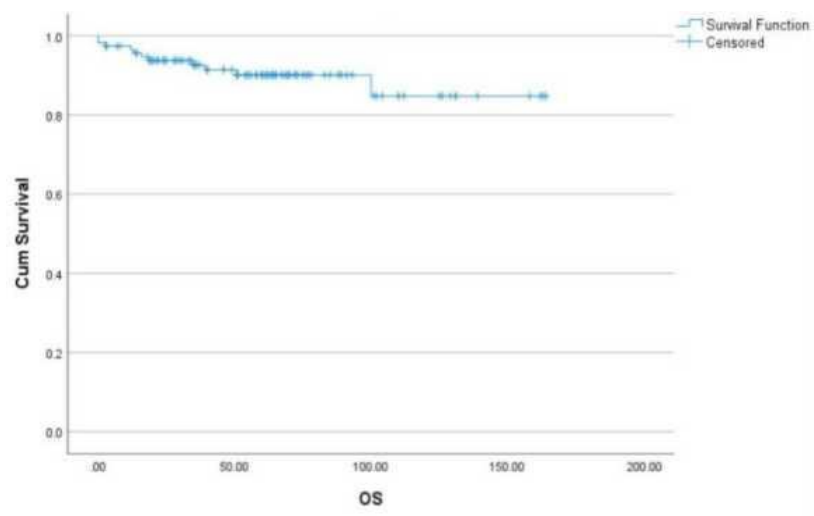
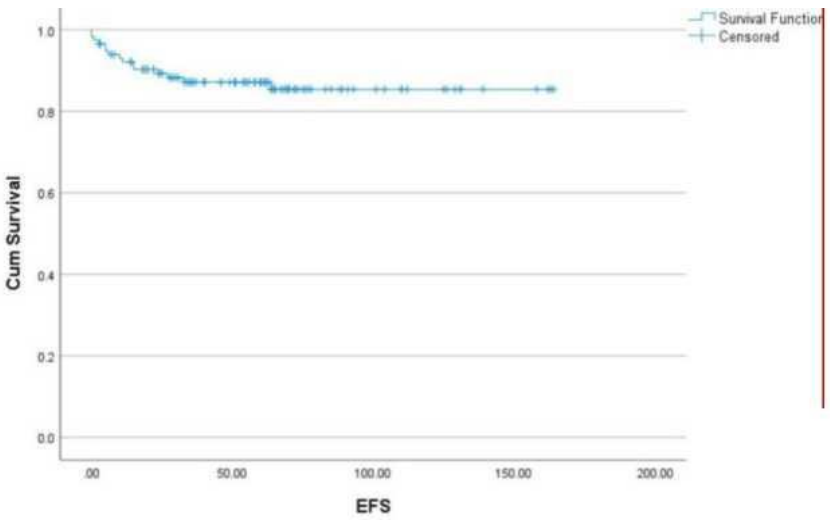


Fig 2: 5 Year Event free Survival



CONCLUSION

- Our study shows good outcomes for girls with ovarian tumors.
- This study highlights the effectiveness of multimodal treatment strategies, including both surgery and chemotherapy,
- Which lead to improved survival outcomes for pediatric malignant ovarian germ cell tumors patients in low-resource settings.

References:

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