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Toxicity and survival rates in 75 paediatric patients with germ cell tumours treated over a 28 year period at the Charlotte Maxeke Johannesburg academic hospital

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DECLARATION

I, Jennifer Ann Geel, declare that this research report is my own, unaided work. It is submitted in partial fulfilment of the requirements for the degree of Master of Medicine in Paediatrics in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

Signed on this ___ day of _____, 2016.

Supervisor: Professor Janet Poole

DEDICATION

To Thandi, Tamai and Senzo.

PRESENTATIONS

The data in this report has been presented, in part, in the following settings:

1. **Annual congress of the South African Children's Cancer Study Group, Durban, 22-24 May 2009.**

   "A review of 54 patients with germ cell tumours treated at Charlotte Maxeke Johannesburg Academic Hospital: a 25 year retrospective review".
   Oral presentation.

2. **SIOP (International Society of Paediatric Oncology) Africa conference, Cape Town, 21-23 March 2012.**
   "Germ cell tumours in Johannesburg: A 28 year review."
   Oral presentation.

3. **Wits Paediatric Department weekly meeting, 4 April 2012.**

   "What's new in African Oncology?" (Including "Germ cell tumours in Johannesburg")
   Oral presentation.

4. **Kids Cancer and Care workshop, Johannesburg, 26 July 2012.**

   "Germ cell tumours in Johannesburg: A 28 year review."
   Oral presentation.

ABSTRACT

Germ cell tumours have a good prognosis if treated aggressively but the consequence of cure may be life-altering toxicity. Prolonged duration of symptoms is often thought to contribute to poor outcomes in patients with solid tumours.

Aims:

To document incidence, survival rates, extent of treatment-related toxicity and to identify poor prognostic indicators in children with germ cell tumours treated at the Charlotte Maxeke Johannesburg Academic Hospital. A secondary aim was to determine which classification system had validity in this cohort.

Methods:

A retrospective file review was conducted of children with germ cell tumours treated at the Charlotte Maxeke Johannesburg Academic Hospital over a 28 year period. Descriptive statistics were employed to document incidence, toxicity rates and outcomes. Kaplan-Meier estimations were performed to determine prognostic factors.

Results:

Seventy five patients were identified, 17 with benign tumours, 56 with malignant tumours and two unknown. Chemotherapy was given to 48 patients, in whom 32 (67%) experienced significant myelotoxicity. Of the 41 patients treated with cisplatin, 34% developed clinically significant hearing impairment. Five patients developed renal tubular acidosis, and two developed chronic renal failure.

The only independent factor found to have prognostic significance was complete surgical excision. There was no correlation between prolonged duration of disease-specific symptoms and poor outcome. The classification of patients according to the IGCCC system does not appear to correlate closely with determinations of prognosis, in comparison with conventional staging systems.

All patients who relapsed did so in the first 3 years after diagnosis. The 3 year overall survival rate was 77.8%. There were no recorded cases of secondary malignancies or chemotherapy-induced infertility.

Conclusion

Complete surgical excision is vital for survival. Transient myelotoxicity and permanent hearing impairment are common when protocols incorporating cisplatin are used. Survival rates are acceptable for a middle-income country. Every effort should be made to preserve the good survival rate while decreasing toxicity.

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ABBREVIATIONS

α-FP	alpha fetoprotein
BEP	bleomycin, etoposide, cisplatin (modified protocol includes vinblastine)
β-hCG	beta human chorionic gonadotrophin
CMJAH	Charlotte Maxeke Johannesburg Academic Hospital
CNS	central nervous system
COG	Children's Oncology Group
EFS	event free survival
FIGO	International Federation of Gynecology and Obstetrics
GCSF	granulocyte colony stimulating factor
GCT	germ cell tumour
HIC	high income countries
ICE	ifosfamide, carboplatin, etoposide
IGCCC	International Germ Cell Consensus Classification
LDH	lactate dehydrogenase
LMIC	low and middle income countries
LTFU	lost to follow up
JEB	carboplatin, etoposide, bleomycin
POU	paediatric oncology unit
RCT	randomised controlled trial
SIOP	Societé Internationale de Oncologie Paediatrique
SMN	second malignant neoplasm
OS	overall survival
UKCCSG	United Kingdom Children's Cancer Study Group
VEC	vincristine, etoposide, carboplatin
YST	yolk sac tumour

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