

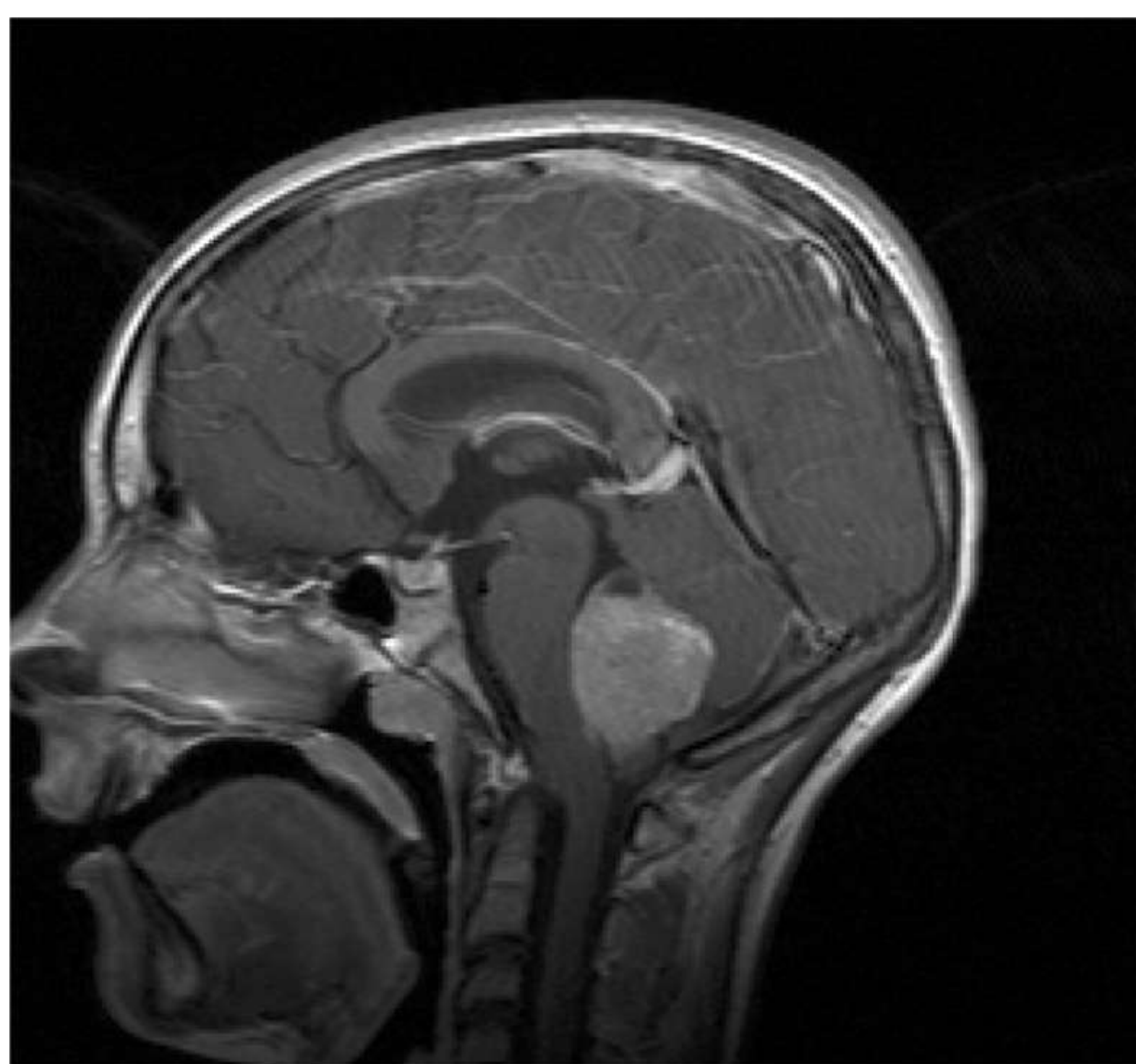
Endocrine dysfunction following treatment of medulloblastoma: a single centre experience

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Introduction

Medulloblastoma is the most common paediatric brain tumour and accounts for 20-30% of all brain tumours in the first decade of life¹. Improvements in treatment strategies have enhanced long-term survival resulting in an increased risk of late sequelae¹. Endocrine dysfunction is one of the commonest late effects in brain tumour survivors² as the hypothalamo-pituitary axis is susceptible to radiation damage. Although some studies suggest that chemotherapy potentiates the deleterious effect of radiotherapy on the hypothalamo-pituitary axis, this is not widely accepted².



Aims

Review the prevalence of endocrine dysfunction in survivors of medulloblastoma at a single centre with a regular multidisciplinary paediatric oncology late effects clinic

Methods

Case note review of patients treated for medulloblastoma between 1982-2002

Results

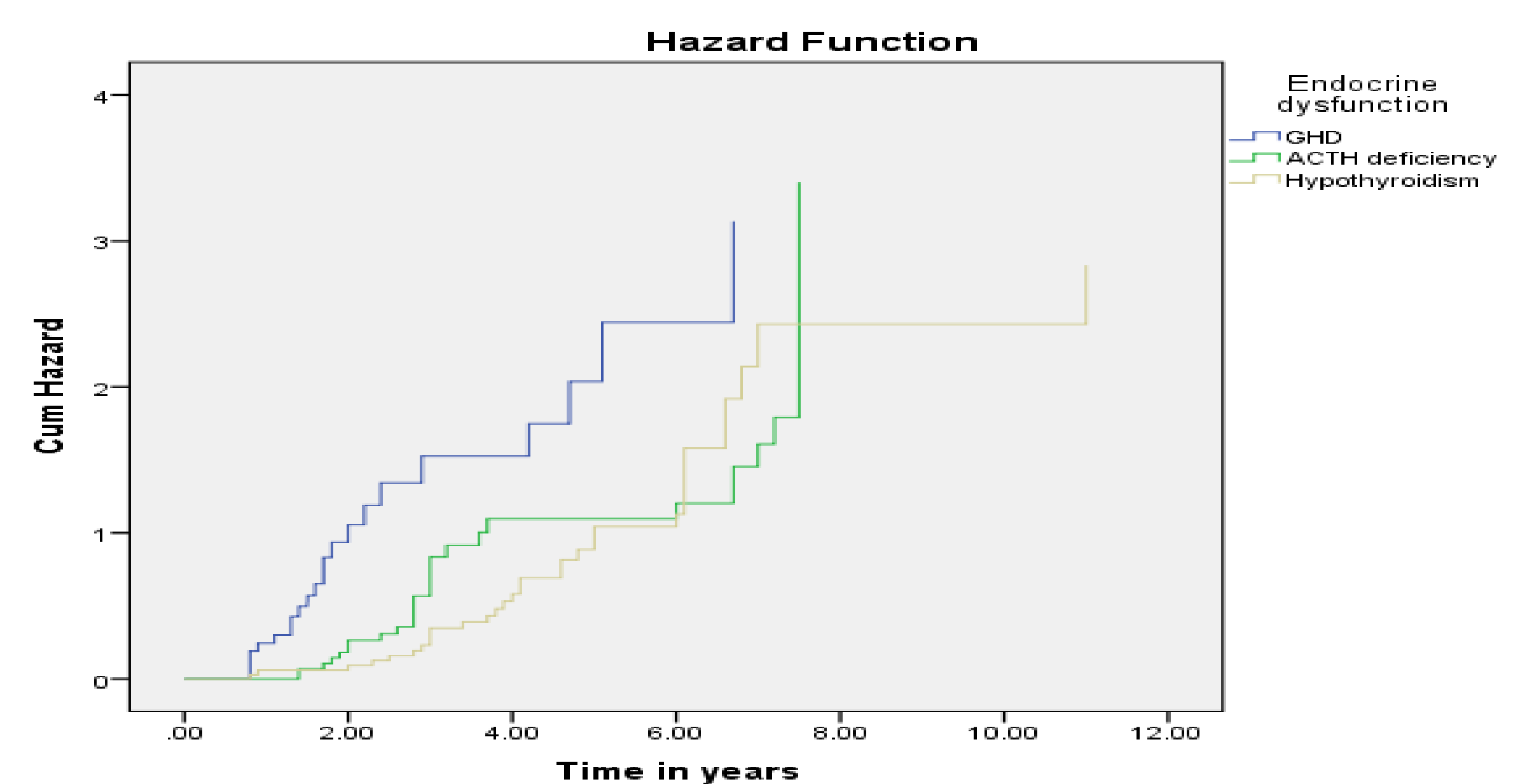
Twenty nine patients (22 males) were identified. Mean (\pm SD) age at diagnosis was 7.7 (\pm 4.1) years. All patients received radiotherapy and 76% also received chemotherapy, comprising of Vincristine, Cisplatin and Cyclophosphamide or CCNU(Lomustine). Mean dose of craniospinal irradiation and posterior fossa boost were 33.5 (\pm 3.6) and 24 (\pm 10) Gray respectively. All except one patient received a posterior fossa boost.

References

1. Fossati P, Ricardi U, Orecchia R. Pediatric medulloblastoma: toxicity of current treatment and potential role of protontherapy. *Cancer Treat Rev*. 2009 ;35(1):79–96.
2. Gleeson HK, Shalet SM. The impact of cancer therapy on the endocrine system in survivors of childhood brain tumours. *Endocrine-Related Cancer*. 2004;11;589–602

Results

All patients developed pituitary hormone insufficiency. Median duration to hormone deficiency from end of treatment are indicated on the Kaplan-Meier analysis below:



All except one patient developed GH deficiency both clinically (growth failure, fatigue) and biochemically. Primary hypothyroidism was the next most prevalent endocrine deficit followed by ACTH deficiency as shown in the table below. Similar to previous reports, secondary hypothyroidism was rare. All patients with ACTH deficiency also had GH and thyroid hormone deficiency except one patient, who had received the lowest posterior fossa boost of 18 Gray and had no surgical intervention.

	GH deficiency	ACTH deficiency	Thyroxine deficiency
% patients with	96.5% (n=28)	31% (n=9)	44.8% (n=13)

Forty-one percent (67% male) had precocious puberty and received gonadotrophin-releasing hormone analogues to optimize growth. None of the patients developed gonadotrophin deficiency while under follow-up in the paediatric clinic.

Conclusions

There is a high prevalence of endocrine dysfunction in medulloblastoma survivors. Figures from our unit for GH and ACTH insufficiency are higher than those published in the literature, despite comparable radiation doses, and may be due to the added toxicity from chemotherapy as these treatment regimens have changed over the years. It may also be in part due to the screening and treatment protocols established in our multidisciplinary clinic which ensure that all patients are assessed by a paediatric endocrinologist early after completion of treatment.

Effective multidisciplinary management in a late effects joint clinic, where endocrine dysfunction in survivors of brain tumours can be anticipated, allows for early diagnosis and prompt treatment to ensure maximal growth and wellbeing.