Obesity is common at diagnosis of childhood pituitary adenoma, and may persist following successful treatment

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Introduction

- Pituitary adenomas (PA) occur rarely in childhood and adolescence, and account for 3% of all intracranial paediatric neoplasm (1), and between 3 - 6% of all PA (2).
- A number of studies describing paediatric PA have been reported, but typically in small cohorts of patients and including patients age up to 20 years of age at diagnosis (3)
- In adult patients, obesity and an adverse cardiovascular profile are reported commonly
- To our knowledge, very few data are available reporting long term treatment outcomes in children and young people.

Study Design

Subjects:
- Retrospective case note review of patients treated within a single, continuous service initially at Alder Hey Children's Hospital with subsequent care in the adult service at University Hospital Aintree and the Walton Centre for Neurology and Neurosurgery (Liverpool, UK).

Methods:
- The following data were collected: Presenting history, physical examination, MRI findings, biochemical assessment of pituitary function and mode of treatment.
- The following data were collected from the most recent review: pituitary hormone deficiencies, medical treatment and body mass index (BMI).
- Results of genetic tests were also recorded.
- Growth hormone deficiency (GHD) in childhood was defined as peak growth hormone (GH) <6.7 mcg/l (Adult-onset GHD: peak GH <3 mcg/l).
- Cortisol deficiency was defined as suboptimal response (<450 nmol/L) to low dose short Synacthen test (LDSST).

Statistical analysis:
- Data were analysed using IBM SPSS 23.0 software. Data are reported as median (range).

Aim

- To contribute to existing observational data in patients age <16 years at diagnosis of PA
- To report the prevalence of obesity at diagnosis and following successful treatment

Results

- 24 patients were followed for 3.3 (0.6 to 8.4) years
- Thirteen patients had prolactinomas
- Five patients had Cushing's Disease
- Six patients had non-functioning PA
- Fourteen patients were obese (BMI SDS >2) at diagnosis and 12 (52%) patients were obese (BMI 3.09 SDS; range: 2.05 to 3.79 SDS) at most recent review.
- Clinical data are reported in Table 1.
- An example of a recurrent macroadenoma in a patient with Cushings Disease is shown in Figure 1.

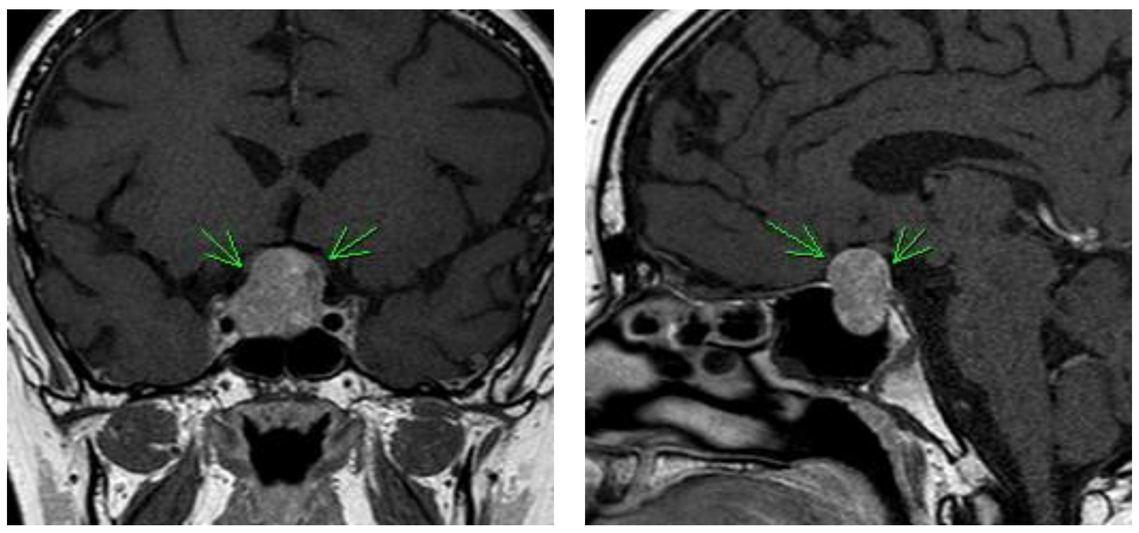

Figure 1: MRI brain at presentation T1 weighted enhanced by gadolinium. coronal and sagittal views showing a large pituitary macroadenoma(2.1x1.6x2.3 cms)

Table 1: Clinical characteristics of 24 patients with pituitary adenomas

Adenoma type	Age (years)	Sex	Duration of follow up (years)	Clinical features at presentation	Adenoma size	Management	Recurrence and treatment	BMI SDS at diagnosis	Current BMI SDS
Prolactinoma	15.2 (13.2-15.8)	13 Female	2.90 (0.5-12.0)	Menstrual dysfunction (83.0%) Headache (50.0%) Galactorrhoea (41.6 %) Weight gain (41.6 %)	9 Macro: 15mm (14-35mm) 4 Micro: 6.5 mm (4-10 mm)	10: Medical Mx 3: Surgical Mx	N=2 Radiotherapy	1.29 -0.47 to 3.73	1.39 -1.12 to 3.21
NFPA	15.0 (12.0-16.0)	4 Male 2 Female	2.7 (2.0-4.0)	Headache (50.0%) Weight gain(50.0%) Short Stature (50.0%)	4 Macro:24 mm (20-53 mm) 2 Micro: 5 mm (4-6 mm)	4: Surgical Mx	N=2: Surgery + radiotherapy	1.90 -0.13 to 2.71	1.10 -3.54 to 3.48
Cushing's Disease	14.0 (4.0-15.7)	3 Male 2 Female	4.4 (0.5 – 8.0)	Weight gain and recent slow growth	1 Macro:24 mm 4 Micro: 7mm (6-8 mm)	5: Surgical	N=2 Surgery + radiotherapy	3.41 2.12 to 4.07	2.74 0.39 to 3.73

Conclusion

- Paediatric PAs are a diverse and challenging pathology requiring long term follow-up within multidisciplinary teams including adult and paediatric endocrinologists, transphenoidal surgeons and oncologists.
- Prolactinomas in this age group were more likely to be resistant or partially resistant to medical treatment than in adults
- CD and NFPA may recur following long-term remission, and long-term surveillance is essential.
- Obesity at diagnosis and during follow up are common .
- We suggest active weight management should be recognised as an essential part of medical care.

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