

Eating Behavior and Oxytocin in Childhood-onset Craniopharyngioma Patients



Anna Daubenbüchel¹, Monika Warmuth-Metz², Maria Eveslage³, Jale Özyurt⁴, Hermann L. Müller¹,

¹Dep. of Pediatrics and Ped. Hematology/Oncology, Klinikum Oldenburg AöR, Medical Campus University Oldenburg; ²Dep. of Neuroradiology, University Hospital Würzburg; ³Inst. of Biostatistics and Clinical Research, University Münster; ⁴Biological Psychology Lab, Dep. of Psychology, Faculty of Medicine and Health Sciences, Carl von Ossietzky University, Oldenburg ; Germany.

Introduction

Obesity due to hypothalamic lesions (HL) frequently impairs quality of life in childhood-onset craniopharyngioma patients (CP). Oxytocin, a hormone of hypothalamic origin, plays a major role in the regulation of eating behavior and body composition. Associations between eating behavior, eating disorders and oxytocin concentrations in CP have not been analyzed so far.

Oxytocin

Oxytocin is a hormone synthesized by hypothalamic nuclei and secreted through pituitary into circulation. Oxytocin plays a pivotal role in parturition and maternal behavior. Furthermore, oxytocin is involved in regulation of body composition and several behaviors associated with neuropsychiatric disorders, including social interactions, and emotional reactivity.

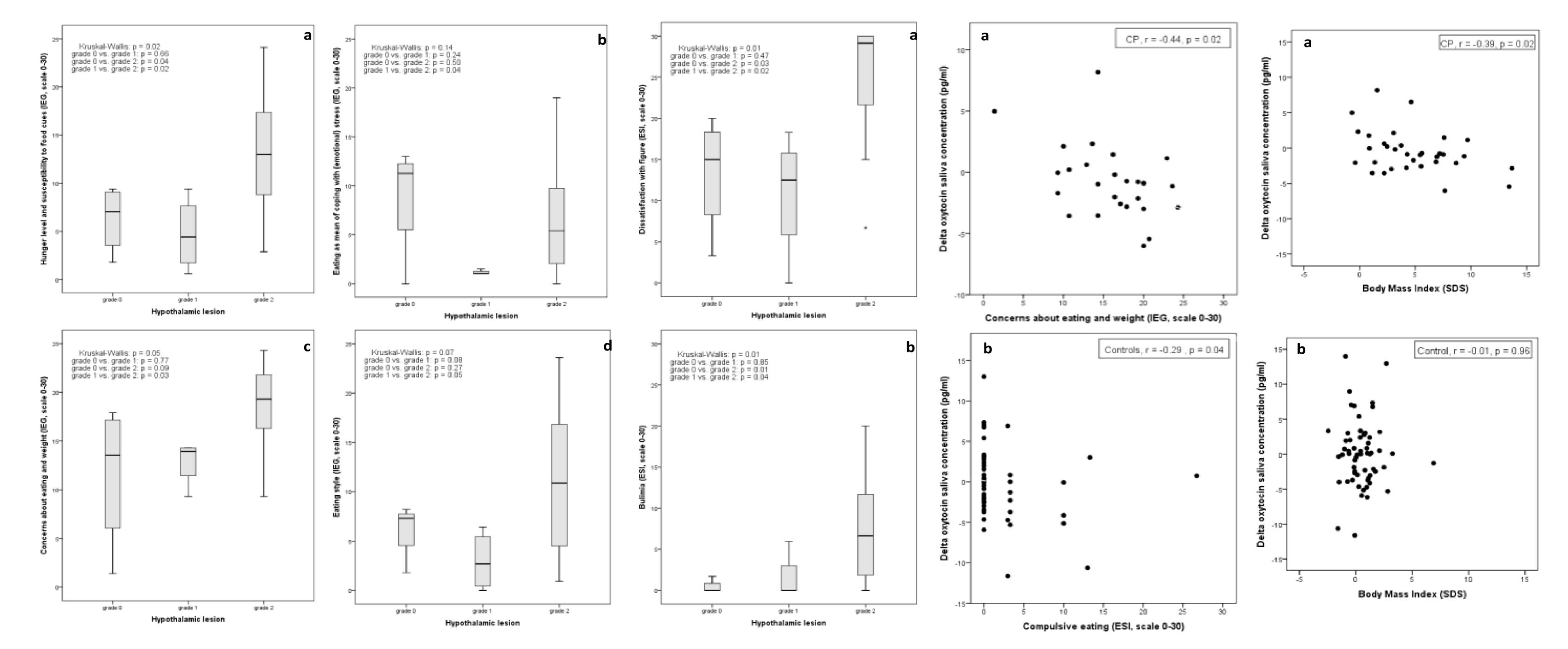


Fig. 1: Comparison of eating behavior in CP with different grade of hypothalamic lesions. Eating behavior was calculated for specific domains by using the Inventory for Eating behavior and Weight Problems (IEGd): **a**) "Hunger level and susceptibility to food cues", **b**) "Eating as mean of coping with (emotional) stress", **c**) "Concerns about eating and weight", and **d**) "Eating style". The grade of hypothalamic lesion was reference-assessed according to the grading system of Müller et al.

Fig. 2: Comparison of eating disorders in CP with different grade of hypothalamic lesions. Eating disorders were assessed for the specific domains of ESId: **a**) "Dissatisfaction with figure", and **b**) "Bulimia".

Fig. 3: Correlation of $\triangle OSC$ (OSC after standardized breakfast minus OSC before breakfast) with **a**) "Concerns about eating and weight" in CP, **b**) Correlation of $\triangle OSC$ with "Compulsive eating" in healthy controls. **Fig. 4:** Correlation of \triangle OSC (OSC after standardized breakfast minus OSC before standardized breakfast) with BMI SDS at the time of study in **a**) craniopharyngioma patients (CP) and **b**) in healthy controls.

Patients and Methods

Cross-sectional study on 34 CP and 73 healthy controls analyzing associations between eating behavior/eating disorders, HL and OSC (oxytocin saliva concentrations). OSC were measured before and after standardized breakfast by immunoassay. Eating behavior was assessed using the Inventory for Eating Behavior and Weight Problems and the Inventory for Eating Disorders.

		Craniopharyngioma	Healthy controls
Study cohorts, n		34	73
Age at study, yr		20 (7 – 41)	39 (7 – 63)
Follow-up interval, yr		11 (1 - 31)	
Gender, female / male		15 (44) / 19 (56)	32 (44) / 41 (56)
Body mass index, SDS		4.3 (-0.7 – 13.7)	0.4 (-2.5 – 6.9)
BMI SDS at study	< +3SDS	12 (35)	64 (88)
	+3 to +8 SDS	16 (47)	3 (4)
	> +8 SDS	5 (15)	_
	missing	1 (3)	6 (8)
Surgery, n (%)		32 (94)	—
Complete surg. resection, n (%)		10 (36)	_
Irradiation, n (%)		14 (41)	
Hypothalamic lesion	No lesions	6 (18)	
	Grade 1	7 (21)	
	Grade 2	14 (41)	_

Pituitary, neuroendocrinology and puberty

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Questionnaires

The Inventory for Eating Behavior and Weight Problems (IEG) serves to self-assess eating attitudes, eating behavior and/or putative problems with body weight. The Inventory for Eating Disorders (ESI) is a self-report measure which can be used to assess symptoms of disordered eating.

Results

For CP with anterior and posterior HL we observed more adverse eating behaviors and symptoms of eating disorders than for CP without HL, with anterior HL, and controls. Eating behavior in CP with anterior HL was similar to that of controls, except for their tendency towards high dietary restraints. Decreases in postprandial compared to fasting OSC were associated with adverse eating behavior in CP and controls as measured by IEG / ESI, respectively, and with higher BMI in CP.

Conclusions

Different grades of HL are associated with distinct patterns of eating behavior. Reduced postprandial compared to fasting OSC is associated with weight problems in CP and with adverse eating behavior and eating disorders in both CP and healthy controls.



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