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BODY COMPOSITION AND NUCHAL SKINFOLD THICKNESS IN PEDIATRIC BRAIN TUMOR PATIENTS

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Introduction: Obesity, cardiovascular disease, and relapse/progression have major impact on prognosis in pediatric brain tumor patients. Cranial MRI is part of routine follow-up.

Objectives: In a cross-sectional study, we analyzed nuchal skinfold thickness (NST) on MRI performed for brain tumor follow-up monitoring as a novel parameter for body composition and cardiovascular disease in 177 brain tumor patients (40 WHO grade 1–2 brain tumors; 31 grade 3–4 brain tumors; 106 craniopharyngioma), and 53 healthy controls.

Methods: NST was quantified on T1-weighted cranial MRI images of the midline performed on 1.5 Tesla MRI scanners according to a standardized procedure. First, a line was drawn crossing the two anatomically defined points: basion (anterior margin of the foramen magnum) and opisthion (posterior margin of the foramen magnum). The diameter of subcutaneous nuchal fat was measured over this line to the nearest 0.01 cm using OsiriX® (Pixmeo SARL, Switzerland). Arithmetic mean of NST as measured in triplicate by three independent persons was analyzed. The interrater reliability of the used arithmetic mmean of NST was 0.982.

Results: Associations of NST with body mass index (BMI), waist-to-height ratio, caliper-measured skinfold thickness, and blood pressure were analysed in brain tumor patients and healthy controls. Craniopharyngioma patients showed higher BMI, waist-to-height ratio, NST and caliper-measured skinfold thickness when compared with brain tumor patients and healthy controls, whereas these differences were not detectable between brain tumor patients and healthy controls. However, WHO grade 1–2 brain tumor patients were observed with higher BMI, waist circumference and caliper-measured triceps skinfold thickness when compared to WHO grade 3–4 brain tumor patients. NST showed high correlations with BMI, waist-to-height ratio, and caliper-measured skinfold thickness. NST, BMI and waist-to-height ratio had predictive value for cardiovascular disease in terms of increased blood pressure, and in multivariate analysis, only BMI was selected for the final model resulting in an odds ratio of 1.25 (1.14–1.379). In craniopharyngioma patients with hypothalamic involvement/lesion or gross-total resection, rate and degree of obesity were increased.

Conclusion: As monitoring of MRI and body composition play an important role in follow-up after brain tumor, we conclude that NST could serve as a novel useful parameter for assessment of body composition and cardiovascular disease risk in brain tumor patients.

Disclosure of Interest: None Declared