The effect of exercise on cognitive functioning in children and adolescents: A neuroendocrinological explanation

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There is a need to discuss the impact of Physical Education on cognitive performance (and give a possible explanation), because these programs are required to contribute to the primary mission of schools, i.e., the promotion of academic performance. This talk is devoted to understand how physical activity is related to neuroendocrinological alterations in adolescents and how these changes influence cognition and motor control or coordinative skills. The results of the studies presented here are good to develop methods for improving the effectiveness of physical activity interventions by tailoring them to account for individual benefits in academic performance in schools. The results will lead to the conclusion that acute physical activity enhances cognitive performance, and, at the same time, affects the release of steroid hormones. Consequently, the shift in hormone concentration is jointly responsible for cognitive changes. Often, reports in support of the association of physical activity and cognitive performance as well as steroid hormones are backed by data from adults. For this reason, we collected data from children and adolescents that reasonably complement the triangular effect of acute exercise – cognitive performance – concentration of steroid hormones. We will provide evidence to promote this relation as well as examples how to apply this results in a school setting. The talk will end with the results of a longitudinal study we recently conducted which deals with the effect of additional exercise training on cognitive functioning, emotional parameters and hormonal functions.

Visual evoked potentials in children and adolescence with neurofibromatosis type 1

Dragana Vucinic
University of Belgrade, Serbia

Purpose: Neurofibromatosis type 1 (NF1) is one of the most common autosomal dominant genetic disorder with a great variability of clinical expression. Children with NF1 have an increased risk of developing Optic Pathway Gliomas (OPGs) during childhood. The role of Visual Evoked Potential (VEP) in the management of children with NF1, with and without OPGs, are controversial. The purpose of this investigation was to determine: (1) if VEP abnormalities could be identified in children with NF1 with no MRI evidence of OPGs; and (2) can screening for OPG in patient with NF1 be performed with VEP testing?

Methods: We retrospectively reviewed VEP records of the 29 patients with NF1 who have had both, MRI and VEP. Pattern Reversal Visual Evoked Potentials (PR-VEP) were performed using standardized technique, on Medelec Sapphire Premiere device.

Results: 29 children and adolescents were examined. Of those, 18 had pathological VEP: eight with the P100 latency prolongation, six with decreased amplitude, four with significant interocular amplitude difference. One of four patients with OPG has normal VEP.

Conclusion: Our study showed that some degree of abnormalities could be identified in a significant number of patients, independently of presence of OPG. This may represent a marker of abnormal visual processing. Despite their limitations, VEPs would have provide useful adjunct to clinical ophthalmologic review to identified children at risk for visual impairment.

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