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Hormonal and non-hormonal factors contributing to chronic fatigue after traumatic brain injury

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Background: Every year, 30,000 subjects suffer a traumatic brain injury (TBI) in the Netherlands. About two thirds will develop post-TBI chronic fatigue (pTBI-CF).

Aim: The aim of this study is to identify the hormonal and non-hormonal etiological factors of pTBI-CF with a focus on those factors that may be reversible with treatment.

Patients & Methodology: To quantify fatigue severity, a validated questionnaire was sent to 332 pTBI patients, about 10 years after their trauma. A random sample of 100 patients was asked to participate in the study and 90 agreed. They underwent an extensive endocrine evaluation, and non-hormonal causes for fatigue were studied by means of questionnaires evaluating sleep, attention, emotional well being, quality of life, coping style and daily activity and dependency. Physical performance was evaluated by the Astrand biking test.

Results: Vitamin D deficiency, defined as a serum 25-hydroxyvitamin D level (25-OHD) <50 nmol/L) was found in 65%, poor sleep quality in 54% and anxiety disorders in 36%. Growth hormone deficiency (GHD) was detected in 24% and gonadal hormone deficiencies (GnHD) in 8%. Fatigue severity was correlated with serum 25-OHD levels (R -0.50, P<0.0001), the Pittsburgh sleep score (R+0.65, P<0.0001) and the anxiety score (R+0.50, P<0.0001), but not with GHD or GnHD. The first three factors together explains 57.9% of the fatigue score variance.

Conclusions: Vitamin D deficiency, poor sleep and anxiety were identified as the most important factors associated with pTBI-CF. Appropriate treatment for these disorders may help to reduce fatigue in pTBI patients.

Recent Publications

1. Geurtsen G J (2010) Comprehensive rehabilitation programmes in the chronic phase after severe brain injury: a systematic review. *Journal of Rehabilitation Medicine* 42(2):97-110.
2. Geurtsen G J et al. (2010) Experienced emotional burden in caregivers: psychometric properties of the involvement evaluation questionnaire in caregivers of brain injured patients. *Clinical Rehabilitation* 24:935-943.
3. Geurtsen G J (2011) Prospective study of a community reintegration programme for patients with acquired chronic brain injury: effects on caregivers' emotional burden and family functioning. *Brain Injury* 25(7-8):691-697.
4. Kampen P J et al. (2011) Potential risk factors for developing heterotopic ossification in patients with severe traumatic brain injury. *J. Head. Trauma. Rehabil.* 26(5):384-391.
5. G J Geurtsen et al. (2011) A prospective study to evaluate a residential community reintegration programme for patients with chronic acquired brain injury. *Archives of Physical Medicine and Rehabilitation* 92(5):696-704.

Biography

Juan D Martina, MD Psychiatrist, is currently a Senior Consultant at the Rehabilitation Centre Curacao, Dutch Caribbean. Until 1st of October 2015 he was the Chairman of the Rehabilitation Department and Director of the P&RM Residency program at Medisch Spectrum Twente Hospital and Vice-Chairman of the Medical Staff of Roessingh Rehabilitation Centre in Enschede, The Netherlands. He was the President of the Dutch Society of Physical and Rehabilitation Medicine (VRA) from March 2009 until November 2014 and was Vice-Chairman of the National Innovation Steering Committee of the association of rehabilitation hospitals (RN) until 2015. Since 2014 he also chaired the national working group for the development of clinical guidelines for spasticity treatment, published in 2017. His areas of interest are healthcare management, traumatic brain injury, spasticity and medical technology. With his experience in these fields he has contributed in numerous occasions as an Invited Lecturer across different scientific conferences worldwide.

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