Official Journal of the European Paediatric Neurology Society

Editorial

Instrumented gait analysis of patients with Dravet syndrome

Dravet syndrome is a developmental and genetic encephalopathy characterized by seizure onset in infancy, intellectual disability and in many children development of gait abnormalities.[1,2] There has been a recent research focus on new pharmacological treatments for seizures in the syndrome but it is important that attention continues to be paid to other aspects of the disorder including gait abnormalities as this may result in improvements in rehabilitation therapy and quality of life. From a biomechanics perspective, patients with Dravet syndrome exhibit abnormal hip and knee flexion combined with greater ankle dorsiflexion which combine to produce what is referred to as "crouch gait". In addition, musculoskeletal mal-alignments can appear with time.[3] Usually the motor difficulties of patients with Dravet syndrome are assessed through clinical observational analysis and video recording due to the challenges of collaboration in children with learning and behavior problems. More recently, instrumented three dimensional gait analysis by means of optoelectronic systems has been demonstrated to be the most reliable approach in providing objective and accurate gait measurements.

In this issue, Di Marco and colleagues examined gait modification in patients with Dravet syndrome through instrumented gait analysis.[4]

This cross-sectional multi-center study was conducted on a cohort of seventy-one subjects enrolled in: Pediatric Neurology Unit of Antwerp University Hospital (Belgium); Istituto Neurologico C. Besta, Milano; Padova University Hospital (Italy) and Verona University Hospital (Italy). Kinematic data of patients were collected in the M^{2}OCEAN Movement Analysis Laboratory, University of Antwerp, Belgium and the Laboratory of Clinical Analysis and Biomechanics of Movement, University Hospital of Padova, Italy. Kinematics and spatiotemporal parameters of walking trials were evaluated through optoelectronic systems. The results from observational analysis unveil two distinct motor patterns statistically confirmed by gait analysis variables but not in the anamnestic and clinical data. The first walking strategy named "*atypical-crouch*" was characterized by a greater amount of hip and knee flexion during stance phase, higher dorsiflexion at the loading response combined with increased step width. An increased step width was also observed in the second pattern, the "*straight*", combined with an increased hip flexion at the terminal stance. The authors hypothesized that these two walking patterns arise from different motor control systems, both related to stabilization mechanisms.

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https://doi.org/10.1016/j.ejpn.2019.10.005