Abstract

Background: In certain diseases, functional constraints establish a greater relationship with muscle power than muscle strength. However, in hereditary peripheral polyneuropathies, no such relationship was found in the literature. Objective: In children with Charcot-Marie-Tooth (CMT), to identify the impact of muscle strength and range of movement on the static/dynamic balance and standing long jump based on quantitative and functional variables. Method: The study analyzed 19 participants aged between 6 and 16 years, of both genders and with clinical diagnoses of CMT of different subtypes. Anthropometric data, muscle strength of the lower limbs (hand-held dynamometer), ankle and knee range of movement, balance (Pediatric Balance Scale) and standing long jump distance were obtained by standardized procedures. For the statistical analysis, Pearson and Spearman correlation coefficients were used. Results: There was a strong positive correlation between balance and the muscle strength of the right plantar flexors (r=0.61) and dorsiflexors (r=0.59) and a moderate correlation between balance and the muscle strength of inversion (r=0.41) and eversion of the right foot (r=0.44). For the long jump and range of movement, there was a weak positive correlation with right and left plantar flexion (r=0.20 and r=0.12, respectively) and left popliteal angle (r=0.25), and a poor negative correlation with left dorsiflexion (r=–0.15). Conclusions: The data on the patients analyzed suggests that the maintenance of distal muscle strength favors performance during balance tasks, while limitations in the range of movement of the legs seem not to be enough to influence the performance of the horizontal long jump.

Keywords
Charcot-Marie-Tooth disease; strength; balance; range of movement; assessment; physical therapy.