PATIENT-SPECIFIC DETERMINANTS OF RESPONSIVENESS TO ROBOT-ENHANCED TREADMILL THERAPY IN CHILDREN AND ADOLESCENTS WITH CEREBRAL PALSY.

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ABSTRACT

AIM: The aim of the study was to evaluate patient-specific determinants of responsiveness to robot-enhanced repetitive treadmill therapy (ROBERT) in patients with early-developed movement disorders.

METHOD: Patients were treated over 12 sessions during a 3-week period. Gross Motor Function Measure-66 (GMFM-66) scores 1 day before ROBERT were compared with scores recorded 1 day after ROBERT. The association of GMFM-66 baseline score, age, sex, aetiology, and add-on botulinum toxin therapy to response to treatment was assessed.

RESULTS: Eighty-three patients aged between 4 and 18 years (48 males, 35 females; mean age 10y 8mo, SD 6y 1mo; Gross Motor Function Classification System level I [n=12], II [n=21], III [n=35], IV [n=10], and V [n=1]) were each treated for a total of 7.2 (SD 1.9) treadmill walking hours. Aetiology was bilateral spastic cerebral palsy (BS-CP; n=69), unilateral CP (n=3), ataxic CP (n=3), hereditary spastic paraparesis (n=6), and genetic syndrome including spasticity (n=2). Meaningful improvements were observed in GMFM-66 (+2.5; 95% CI 2.0-3.0), GMFM-D (+5.2; 95% CI 3.6-6.8), and GMFM-E (+4.0; 95% CI 2.8-5.3). There was a high inter-individual variability in treatment response. After multivariable adjustment, the improvements in GMFM-66 and GMFM-E scores were positively associated with the GMFM-66 baseline score. The effect on GMFM-D improvement was inversely associated with age.

INTERPRETATION: Gross motor abilities at baseline and age were identified as relevant determinants for the high degree of interpersonal variability in response to ROBERT.