FUNCTIONAL STATUS OF ADULTS WITH CEREBRAL PALSY REPRESENTED IN GMFCS LEVELS AND IN A GAIT NOMOGRAM

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INTRODUCTION
The Gross Motor Function Classification System (GMFCS) is an overall method used to categorize children [1] and adults [2] with cerebral palsy (CP) into 5 levels based on their gross motor performance. To monitor patients’ functional status, outcome measures like the gait nomogram, based on temporal-distance parameters as described by Vaughan & O’Malley [3], can be used. Our question is: Are the differences in functional status as classified by GMFCS levels reproduced by the gait nomogram?

METHODS
As part of a long-term follow-up study, 31 patients with CP who had received the spasticity-releasing neurosurgical procedure selective dorsal rhizotomy, were classified into the first 3 (ambulatory) GMFCS levels. In addition, they were asked to walk with their own customary gait on a walkway that was 10 m long. Temporal-distance parameters (step frequency, step length and speed) were captured with an eight-camera Vicon system (250 Hz). These parameters were normalised by the patients’ leg length, based on the method of Hof [4], which converted the outcomes into dimensionless values. The mean age of the 31 patients was 28.7 years (range 21.4 – 44.5 years) and included 18 males and 13 females.

RESULTS AND DISCUSSION
Of the 31 patients with CP who participated in the study, 15 were classified at GMFCS level I (walks without limitations), 11 at GMFCS level II (walks with limitations) and 5 at GMFCS level III (walks with hand-held mobility).

Figure 1 shows the distribution of patients’ outcomes in the gait nomogram. Group I are clustered around V1 and V2, group II shows a greater variability and are scattered between V2 and V3, while group III are more concentrated around V3. Table 1 gives the median values for each group per parameter. Statistical analysis showed no significant differences between the 3 GMFCS groups for dimensionless step length, and only between groups I and III for dimensionless step frequency (p<0.01). However, the median values of group I were significantly different to groups II and III for dimensionless speed (p=0.02 and p<0.01 respectively) (Figure 2).

CONCLUSIONS
The gait nomogram shows that the patients classified at GMFCS Levels I, II and III present different functional status based on their dimensionless temporal-distance parameters. However, this outcome is based on a limited sample size and may not be significant for all parameters.

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REFERENCES