Abstract

Background: The optimization of gait performance is an important goal in the rehabilitation of children with cerebral palsy (CP) who present a prognosis associated with locomotion. Gait analysis using videos captured by digital cameras requires validation. 

Objective: To evaluate the validity of a method that involves the analysis of videos captured using a digital camera for quantifying the temporal parameters of gait in toddlers with normal motor development and in hemiplegic children with mild motor impairment: a validity study.

Method: Eleven toddlers with normal motor development and eight children with spastic hemiplegia who were able to walk without assistive devices were asked to walk through a space contained in the visual field of two instruments: a digital camera and a three-dimensional motion analysis system, Qualisys Pro-Reflex. The duration of the stance and swing phases of gait and of the entire gait cycle were calculated by analyzing videos captured by a digital camera and compared to those obtained by Qualisys Pro-Reflex, which is considered a highly accurate system.

Results: The Intraclass Correlation Coefficient (ICC) demonstrated excellent agreement (ICC > 0.90) between the two procedures for all measurements, except for the swing phase of the normal toddlers (ICC = 0.35). The standard error of measurement was less than 0.02 seconds for all measures.

Conclusions: The results reveal similarities between the two instruments, suggesting that digital cameras can be valid instruments for quantifying two temporal parameters of gait. This congruence is of clinical and scientific relevance and validates the use of digital cameras as a resource for helping the assessment and documentation of the therapeutic effects of interventions targeted at the gait of children with CP.

Keywords
Gait, toddlers, cerebral palsy, image processing, computer-assisted, rehabilitation.