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Relationship between degree of functionality of the affected upper limb and spatiotemporal parameters of gait in post-stroke hemiplegic patients in Neurology Physiotherapy Unit at National Hospital of Sri Lanka

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Background: Stroke can cause hemiplegia that affects the gait and the upper limb functionality. The association between impairments of gait and impairments of upper limb functionality has not been deeply explored in the Sri Lankan context.

Objective: To determine the relationship between degree of functionality of the affected upper limb and spatiotemporal parameters of gait in post-stroke hemiplegic patients attending Neurology Physiotherapy Unit at National Hospital of Sri Lanka.

Methods & Materials: A descriptive cross-sectional study. Forty-five males and 35 females with a mean age of 60.78 years were selected by convenient sampling method. The QuickDASH questionnaire was used to assess the functionality of the affected upper limb. A video was made while the subject was performing 4 m walk test. The spatiotemporal parameters were calculated by analyzing the video using Kinovea software (version 0.8.15). Data were analyzed by descriptive statistics, independent sample t-test and Pearson correlation test in SPSS software (version 20). The results were considered significant if $p<0.05$.

Results: The mean (±SD) of time of completion, comfortable speed, maximum speed, cadence, stride time of the paretic side of gait of the sample were 20.04s (±20.514), 0.36ms^{-1} (±0.23), 0.49ms^{-1}(±0.31), 69.55min^{-1}(±23.58) and 0.97s (±0.31) respectively. The mean (±SD) of the QuickDASH score was 39.34 (±20.83). Although the stride time of the paretic side (p=0.046) and the time of completion (p=0.003) of the subject increased with the increase of QuickDASH score, the comfortable speed (p=0.0001), maximum speed (p=0.00008) and cadence (p=0.001) decrease. So concerning QuickDASH score and 4m walk test, moderate correlations were found for: time of completion, comfortable speed, maximum speed, and cadence.

Conclusion: With the decrease of upper limb functionality efficacy of gait was affected in a post-stroke hemiplegic patient. Hence, during the rehabilitation of post-stroke hemiplegic patients, it is recommended to engage the patient early in upper limb exercises to improve functionality, which will in turn help to improve walking.