Ankle Flexion as a Differentiative Measure in Orthotic Device Prescription for Individuals with Stroke

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Background

- **Motivation:** Gait and balance impairments due to delayed and diminished muscle activation is a well-known consequence of a stroke that has caused nearly half of the 6.5 million stroke survivors in the US to fall.

- **Objective:** Observe ankle strength data in relation to simulated fall data while taking into account the prescribed AFO variant to study its effectiveness in preventing falls and catering to the specific needs of the patient.

Protocol

The Maximum Voluntary Contraction (MVC) during Plantarflexion and Dorsiflexion were recorded on the paretic and non-paretic legs of subjects using a Biodex Machine. Subjects were classified as Post-Stroke Patients that:
1. Use no Orthotic Device
2. Use a prescribed Thermoplastic AFO
3. Use a prescribed Functional Electrical Stimulation AFO (FES)

Preliminary Results & Conclusions

- Dorsiflexion Strength is lower in Thermoplastic and FES Variants compared to non-user MVC Data due to Locked-Ankle position that causes muscle inactivity.
- It is narrowly observed that subjects with lower levels of Plantarflexion MVC tend to fall more often. Further analysis is necessary.

Way Forward

- Study Fall Percent data in relation to Reaction Time
- Study Orthotic Device Variant Data in relation to Fall Percent Data
- Explore Fall Coping Mechanisms in relation to prescribed AFO variant

References


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