After stroke, weakness and impaired control of the paretic limb contribute to an impaired ability to generate forward propulsion during walking. Reduced paretic propulsion is related to slow walking and poor walking economy—factors that reduce function and quality of life.

Key determinants of paretic limb forward propulsion (AGRF) are the:

1. posterior positioning of the limb behind the body: θ
2. ankle plantarflexion torque: M_{PF}

The FastFES Intervention: A 12-week, 36-session rehabilitation program that combines fast locomotor training with plantarflexor functional electrical stimulation (FES) to target deficits in paretic propulsion during gait retraining.

Faster walking increases θ

FES-induced activation of the plantarflexors increases M_{PF}

The FastFES Hypothesis: Targeting deficits in paretic propulsion during gait training will restore more physiological gait patterns and reduce the high energy cost of transport characteristic of poststroke hemiparesis.

Conclusions

- The FastFES gait intervention is effective at reducing the high energy cost of walking typical after stroke
- Better identification of the best candidates for this targeted gait therapy is needed
- Evaluation in the earlier phases poststroke is warranted

Acknowledgements

This work was completed at the University of Delaware and supported by NIH Grants: R01NS010786, T32HD007490, K01HD050582

Key References

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