Physical Activity Before and After Stroke
Examining Stroke Incidence and Outcomes

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Abstract

Background: Stroke is a leading cause of death and disability worldwide. A physically active lifestyle may prevent stroke and decrease the consequences of a stroke. Physical activity is also an important component in secondary prevention and rehabilitation after stroke. This thesis investigates the associations between physical activity before and after stroke in relation to stroke incidence, stroke severity, stroke mortality and functional outcomes after stroke.

Methods: Study I was conducted using a population-based cohort from western Sweden collected in 2001 to 2004. Physical activity was assessed in four domains: leisure, work, transport, and household activities. Stroke incidence and death or dependency 3 months after stroke were recorded with a follow-up of 20 years. Study II and III utilized data from the local stroke-register at Sahlgrenska University Hospital between 2014 and 2019. Pre-stroke physical activity during the prior year was retrospectively evaluated. In Study II, stroke severity and mortality were assessed in patients with ischemic stroke and intracerebral hemorrhage. In Study III, hematoma volume, stroke severity, 1-week functional outcome, and 3-month survival were assessed in patients with intracerebral hemorrhage. In Study IV, data from a randomized controlled trial conducted between 2014 and 2019 was utilized. Physical activity and functional recovery in patients with acute stroke were followed up for 6 months.

Results: In Study I (n=3614) leisure-time and transport physical activity were associated with reduced stroke incidence, and a high level of leisure-time physical activity was associated with a better post-stroke outcome. In Study II (n=5188) pre-stroke physical activity was associated with milder stroke symptoms and post-stroke survival independent of stroke type. In Study III (n=686) pre-stroke physical activity was associated with smaller hematoma volumes in deep and lobar intracerebral hemorrhages, which partly mediated milder stroke symptoms, a good 1-week functional outcome and 3-month survival. In Study IV (n=1367), two distinct physical activity patterns were identified in the first 6 months after stroke: increasing or decreasing physical activity. Increased physical activity was associated with better functional recovery 6 months after stroke. Males and those with normal cognition were more likely to be in the increasing group.

Conclusions: The results of this thesis indicate that physical activity has an important role in both the prevention and treatment of stroke. Being physically active before and after a stroke can improve outcomes following stroke.

Keywords: stroke, exercise, sedentary behavior, mortality, stroke rehabilitation

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