

## Psychological Stress and Accelerated Aging in SCI Patients - A Longitudinal Pilot Feasibility Study

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**Abstract :** A spinal cord injury (SCI) is a traumatic life event that often results in ageing associated health conditions such as muscle mass decline, adipose tissue increase, decline in immune function, frailty, systemic chronic inflammation, and psychological distress and depression. Psychological, oxidative, and metabolic stressors may facilitate accelerated ageing in the SCI population with reduced life expectancy. Research designs using biomarkers of aging and stress are needed to elucidate the role of psychological distress in accelerated aging. The aim of this project is a feasibility pilot study to observe changes in stress biomarkers and correlate them with aging markers in SCI patients during their first rehabilitation (longitudinal cohort study). Biological samples were collected in the SwiSCI (Swiss Spinal Cord Injury Cohort Study) Biobank in Nottwil at 4 weeks $\pm$ 12 days after the injury (T1) and at the end of the first rehabilitation (discharge, T4). The "distress thermometer" is used as a selfassessment tool for psychological distress. Stress biomarkers, as cortisol and protein carbonyl content (PCC), and markers of cellular aging, such as telomere lengths, will be measured. 2 Preliminary results showed that SCI patients (N= 129) are still generally distressed at end of rehabilitation, however we found a statistically significant ( $p < 0.001$ ) median decrease in distress from 6 (T1) to 5 (T4) during the rehabilitation. In addition, an explorative transcriptomics will be conducted on N=50 SCI patients to compare groups of persons with SCI who have different trajectories of selfreported distress at the beginning and end of the first rehabilitation after the trauma. We identified 4 groups: very high chronic stress (stress thermometer values above 7 at T1 and T4; n=14); transient stress (high to low; n=14), low stress (values below 5 at T1 and T4; n=14), increasing stress (low to high; n=8). The study will attempt to identify and address issues that may occur in relation to the design and conceptualization of future study on stress and aging in the SCI population.

**Keywords :** stress, aging, spinal cord injury, biomarkers

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