Changes in cardiometabolic risk factors during inpatient rehabilitation of traumatic spinal cord injury from a multicenter Swiss Spinal Cord Injury Cohort (SwiSCI)

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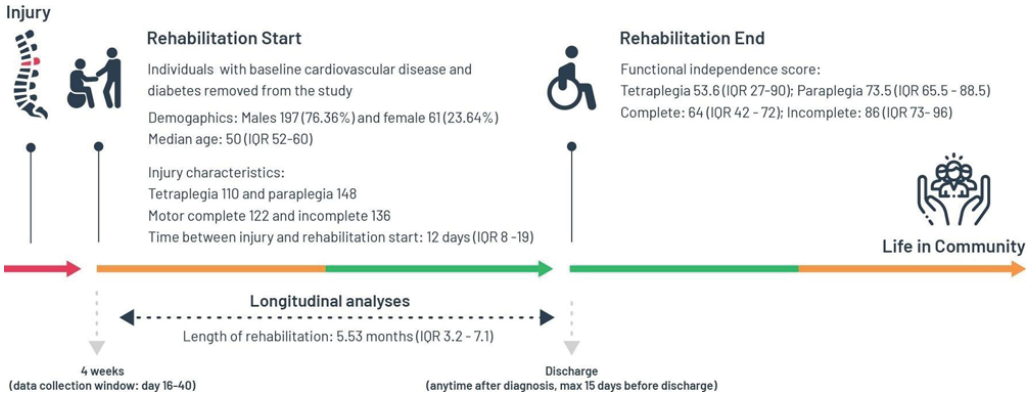
Introduction: Cardiometabolic health has a growing relevance in spinal cord injury (SCI) considering the increasing survival and aging population. We explored longitudinal changes in cardiometabolic risk profile and examined whether injury characteristics could be a non-modifiable risk factor for individuals with SCI in subacute phase of the injury.

Methods: We used the data from a multicenter Swiss Spinal Cord Injury Cohort (SwiSCI) study and included adults with traumatic SCI (TSCI) without cardiometabolic diseases and diabetes at baseline. We included individuals with available data on admission and prior to discharge from first SCI rehabilitation. Blood pressure, lipid profile, fasting glucose, waist circumference (WC), weight, and body mass index (BMI) were compared according to the injury level (tetraplegia-TP vs paraplegia-PP) and completeness (motor complete-COM vs incomplete-INC). We used multivariable linear regression for cross-sectional analysis and linear mixed models for longitudinal analysis, adjusting for age, sex, lifestyle factors, medication-use, and injury characteristics. We performed age- (above and below median age) and sex-stratified analyses. Sensitivity analyses were also performed by removing systemic steroid-use (proxy for acute injury), adjusting for opioid-use (medication side-effect) and adjusting further for BMI and WC.

Results: We analyzed 258 individuals with TSCI (110 TP and 148 PP, 122 COM and 136 INC). Median age was 50 years (IQR 32–60), with 76.36% (n=197) of the population being male. The median rehabilitation duration was 5.5 months (IQR 3.2–7.1). On admission, the fully-adjusted models showed higher baseline weight, systolic BP, diastolic BP and triglycerides in PP than TP. Systolic BP, diastolic BP, HDL, HDL/LDL were higher in INC than COM. In the overall population, we observed increases in cholesterol, HDL, and HDL/LDL ratio over rehabilitation period. Individuals with PP had a higher increase in BMI as compared to TT, while no differences were detected when comparing INC and COM injury (Table 1–3). Results from sensitivity analyses were generally in line with the overall findings; however, at baseline, there was some indication that lipid profile may be different in COM and INC injury. In sex-stratified longitudinal analysis, triglycerides were higher in females PP than TP, and diastolic BP was higher in females with INC than COM. For age-stratified longitudinal analysis, elderly with PP have higher triglycerides than younger adults.

Conclusion: We reported changes in BMI and lipid profile during the inpatient rehabilitation of individuals with traumatic SCI and without history of cardiovascular diseases and diabetes. Injury characteristics may not be an independent risk factor for subacute phase, but maybe important in specific subgroups, like in women and in the elderly (>50 years old).



Methods

Outcome	Overall Population	Paraplegia vs Tetraplegia	Incomplete vs Complete
BMI	⊘	↑	⊘
Waist circumference	⊘	⊘	⊘
Body weight	⊘	⊘	⊘
Systolic blood pressure	⊘	⊘	⊘
Diastolic blood pressure	⊘	⊘	⊘
Total cholesterol	↑	⊘	⊘
Triglycerides	⊘	⊘	⊘
LDL cholesterol	⊘	⊘	⊘
HDL cholesterol	↑	⊘	⊘
HDL LDL ratio	↑	⊘	⊘
Total cholesterol HDL ratio	↓	⊘	⊘
Fasting serum glucose	⊘	⊘	⊘

Results