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Risk of BCVI in Polytraumatised Patients with Cervical Spine Injuries

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Background: This study investigated blunt cerebrovascular injuries (BCVI) as a rare complication to cervical spine injuries (CSI).

Research question: The incidence of BCVI and stroke in a cohort of patients with CSI is unknown. We wanted to determine the incidence and which predisposing factors could lead to BCVI.

Design: Register-based cohort study analysing data from our national trauma registry. Medical records of all CSI patients were systematically reviewed. All data were collected according to current law and ethics.

Methods: Data was analysed from patients admitted to a Level 1 Trauma Centre at one of the four University hospitals in our Country, between 2017 and 2022. Medical records were systematically reviewed, employing the NOMESCO injury classifications, AO's classifications of cervical fracture and Denver screening criteria to evaluate BCVI risk factors. Inclusion criteria comprised blunt force trauma and CSI. Penetrating injuries were excluded.

Results: In a nationwide cohort of 15.328 trauma patients were admitted to one of 4 Level 1 Trauma centres. 688 had CSI, and 174 were admitted to our university hospital. Of those 174, BCVI was observed in 22 patients and 5 suffered strokes. The analysis revealed a significant increase in BCVI odds per year of age ($p=0.013$; $OR=1.03$; $95\% CI=1.006-1.050$) and higher odds of stroke in BCVI cases ($p=0.002$; $OR=33.55$; $95\% CI=33.553-316.824$).

Discussion: This study showed a significant association between BCVI and risk of stroke and an increased risk of BCVI with age. No significant associations were found according to fracture types, BCVI, and injury grade. This could be explained by the small sample size and the rarity of BCVI. The study underscores the importance of a systematic approach for screening polytraumatised patients to ensure timely treatment of BCVI and prevent severe neurological morbidity and mortality.