

**Title: The effect of various types of motorcycle helmets on cervical spine injury in head injury patients: a multicenter study in Taiwan**

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**Abstract**

**Objective:** The relationship between cervical spine injury (CSI) and helmet in head injury (HI) patients following motorcycle crashes is crucial. Controversy still existed; therefore we evaluated the effect of various types of helmets on CSI in HI patients following motorcycle crashes and researched the mechanism of this effect.

**Methods:** A total of 5225 patients of motorcycle crashes between 2000 and 2009 were extracted from the Head Injury Registry in Taiwan. These patients were divided into case and control groups according to the presence of concomitant CSI. Helmet use and types were separately compared between the two groups and the odds ratio of CSI was obtained by using multiple logistic regression analysis.

**Results:** We observed 173 (3.3%) of the HI patients were associated with CSI. The HI patients using a helmet (odds ratio (OR) = 0.31, 95% confidence interval (CI) = 0.19–0.49), full-coverage helmet (0.19, 0.10–0.36), and partial-coverage helmet (0.35, 0.21–0.56) exhibited a significantly decreased rate of CSI compared with those without a helmet.

**Conclusion:** Wearing full-coverage and partial-coverage helmets significantly reduced the risk of CSI among HI patients following motorcycle crashes. This effect may be due to the smooth surface and hard padding materials of helmet.

**Category:** Epidemiology

**Presentation type:** Poster or oral