

Motorcycle Helmet Use Reduces Mortality, Health Care Resource Utilization Impact of Motorcycle Helmets and State Laws on Society's Burden: A National Study.

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Ann Surg 2009; 250 (September): 390-394

Mortality rates and health care resource utilization are lower for motorcycle riders involved in crashes if these riders are wearing helmets.

Background: Motorcycle helmet laws have been under attack from motorcycle advocacy groups who cite flaws in studies that suggest reduced injury in helmeted riders and cite other small studies suggesting increased injuries by helmeted riders.

Objective: To address issues at the forefront of the motorcycle helmet law controversy, particularly injury pattern, helmet use, resource utilization, and death.

Design: Retrospective review of the National Trauma Data Bank.

Methods: Analyzed patients were admitted to hospitals alive after being injured in motorcycle crashes between 2002 and 2007. Data collected included demographics, Glasgow Coma Scale (GCS) score, Injury Severity Score (ISS), Abbreviated Injury Score (AIS), hospital and ICU lengths of stay, admission systolic blood pressure, hospital mortality, payer status (commercial insurance, governmental, or none), and helmet law (universal, none, or age-based). Inclusion required specific identification of helmet use or not.

Results: Of 122,578 patients involved in motorcycle crashes (69%) presenting alive to hospitals, 76,944 had helmet use documented; 58,369 (76%) wore helmets. Mortality rates were significantly lower for helmeted riders (3.8%) than for non-helmeted riders (6.7%). Helmeted riders had a higher GCS score (13.9 vs 13.0), a lower ISS (13.2 vs 14.7), lower head and face AIS, and fewer cervical spine fractures (3.9% vs 5.9%). Helmeted riders had lower ICU lengths of stay (2.3 vs 2.8 days) and fewer hospital stays (6.4 vs 6.9 days). Head injury patterns were less severe for helmeted riders. Helmet use was 90% in states with universal helmet laws, 53% if no law, and 61% for age-based law. Mortality was higher if there was no law (5.9%) or age-based law (4.8%) compared to universal law (4.3%). Insurance data available on 49,701 patients showed 64% with commercial coverage, 13% governmental, and 23% with none; 29% of non-helmeted riders had no insurance compared to 21% of helmeted riders. Multivariate analysis indicated a strong protective effect of helmet use against in-hospital mortality.

Conclusions: Helmet use reduces motorcycle rider mortality rates and resource utilization. Such helmet use occurs more often where laws prescribe helmet use.

Reviewer's Comments: This large database study clearly shows that helmets provide protection for motorcycle riders from mortality and other injuries. Head injury is also less severe. Health care resource utilization, measured by ICU and hospital stays, is also diminished. Because more non-helmeted riders do not have health insurance, helmets therefore reduce societal costs of injuries suffered by motorcycle riders. Because helmet use is greater when laws dictate their use, such laws benefit the individual by reducing mortality, and society by reducing costs. These results are important to share with lawmakers, so that arguments in favor of helmet laws can be enhanced with science, as opposed to emotion. Neurosurgeons, as key providers of care for motorcycle crash victims, should vigorously participate in these discussions.

(**Reviewer**-N. Scott Litofsky, MD). © 2009, Oakstone Medical Publishing