The protective effect of helmet use ... appears to be greater in pedal cyclists compared with motorcyclists

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The effectiveness of helmets in reducing head injuries and hospital treatment costs: a multicentre study

TO THE EDITOR: Debate continues regarding the health benefits and consequences of helmet use in pedal cyclists. Australia is one of few countries in the world with mandatory helmet laws for both pedal cyclists and motorcyclists. To place the protective effect of helmets in pedal cyclists into perspective, we report on the relationship between helmet use and head injury severity in a retrospective cohort of both pedal cyclists and motorcyclists.

Trauma registry data on such patients admitted to seven tertiary level hospitals in Sydney, New South Wales (Liverpool, St George, Royal Prince Alfred, Westmead, Royal North Shore, St Vincent’s and Prince of Wales hospitals) between July 2008 and June 2009 were obtained. Patients were included if they were aged 15 years or over with an incident occurring on a public road. The Abbreviated Injury Scale and Injury Severity Score were used to classify body regions and severity of injury, respectively. Helmet use, incident and other injury details were routinely collected by trained data and case managers from standard ambulance and trauma clinical case notes. Inhospital costs were calculated using standardised cost weights (NSW Program and Product Data Collection, 2008–09). Primary outcomes were any head injury and severe head injury (Abbreviated Injury Scale severity score ≥3), including significant intracranial haemorrhages, and diffuse axonal injury. Logistic regression was used to determine odds ratios for head injury and severe head injury, adjusting for age (as a continuous variable) and location of incident (based on incident postcode) as a-priori confounders based on previous work.

There were 398 cases identified. Of these, 50 patients (13%) had missing helmet information, leaving 348 cases analysed. Baseline characteristics stratified by helmet use are shown in the Box. For any head injury associated with helmet non-use, the adjusted odds ratio was 5.6 (95% CI, 2.1–14.9; \( P < 0.001 \)) for pedal cyclists and 2.2 (95% CI, 0.9–5.0; \( P = 0.06 \)) for motorcyclists, compared with helmeted patients in each group. For severe head injury associated with helmet non-use, the adjusted odds ratio was 5.5 (95% CI, 1.5–20.6; \( P = 0.01 \)) for pedal cyclists and 3.5 (95% CI, 1.3–8.9; \( P = 0.01 \)) for motorcyclists, compared with helmeted patients in each group. For the 50 patients with severe head injury, inhospital costs (AUD) were around three times higher in non-helmeted patients (median, $72 000; interquartile range, $33 000–
The protective effect of helmet use with respect to head injury prevention therefore appears to be greater in pedal cyclists compared with motorcyclists. There was no association observed between helmet use and diffuse axonal injury. Limitations to our study include the small number of patients with severe head injury, and the inability to control for other incident factors such as speed, collision details and intoxication. The use of hospital data biases observations towards patients with more severe injuries. Nevertheless, the results add to the growing weight of observational data supporting the use of helmets, which should therefore be considered at least as protective for pedal cyclists as they are for motorcyclists.

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Letters

$140,000) compared with helmeted patients (median, $24,000; interquartile range, $150,000–$60,000) (P = 0.02).

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