

Correlation between crash avoidance maneuvers and injury severity sustained by motorcyclists in single-vehicle crashes

Abstract

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Objectives:

In order to improve motorcycle safety, this article examines the correlation between crash avoidance maneuvers and injury severity sustained by motorcyclists, under multiple precrash conditions.

Method:

Ten-year crash data for single-vehicle motorcycle crashes from the General Estimates Systems (GES) were analyzed, using partial proportional odds models (i.e., generalized ordered logit models).

Results: The modeling results show that “braking (no lock-up)” is associated with a higher probability of increased severity, whereas “braking (lock-up)” is associated with a higher probability of decreased severity, under all precrash conditions. “Steering” is associated with a higher probability of reduced injury severity when other vehicles are encroaching, whereas it is correlated with high injury severity under other conditions. “Braking and steering” is significantly associated with a higher probability of low severity under “animal encounter and object presence,” whereas it is surprisingly correlated with high injury severity when motorcycles are traveling off the edge of the road. The results also show that a large number of motorcyclists did not perform any crash avoidance maneuvers or conducted crash avoidance maneuvers that are significantly associated with high injury severity.

Conclusions: In general, this study suggests that precrash maneuvers are an important factor associated with motorcyclists' injury severity. To improve motorcycle safety, training/educational programs should be considered to improve safety awareness and adjust driving habits of motorcyclists. Antilock brakes and such systems are also promising, because they could effectively prevent brake lock-up and assist motorcyclists in maneuvering during critical conditions. This study also provides valuable information for the design of motorcycle training curriculum.