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The danger zone: Injuries and conditions associated with immediately fatal motorcycle collisions in the state of Michigan[☆]



DR. ALLAN LAMB (Trenton, Michigan): The authors have presented a novel retrospective analysis of injury patterns and crash factors in unseen fatal motorcycle accidents sustained in the 13-county region in the state of Michigan over a ten-year period. The data was derived from autopsy reports and only included scene fatalities. Cause of death was determined by a single board certified forensic pathologist. The study is limited by a small sample size as identified by the authors with 71 fatalities and 70 autopsies that had associated crash reports. The extent of the injuries described in the fatal accident is not surprising. The writers are to be praised for their hard work to delineate and review the injury patterns and presentations of these 71 fatal accidents. Interestingly, the majority, or 58 of the accidents, occurred at 55 miles per hour or less. 66 of the 71 fatalities were on dry roads. With the small sample size, helmet use, dangerous behavior and hazardous acts did not appear to be significant factors. Additionally, 41 of the 71 riders were helmeted, but only 15 retained their helmet throughout the accident as the authors identified. This, however, was not a significant finding, despite the significant and high rate of TBI and the fatalities at 84 percent. It does attest to the severe nature of these accidents and the importance of a proper fitting helmet.

I agree with your assessment that a more severe or fatal injury is much more likely to occur when the motorcyclist has little or no time to prepare for an impact. I do have a few questions. Number one, do you think exsanguination was a prevalent cause of death in these patients? That was not described in your paper. Hemorrhage was identified, however.

Number two, what was the population density in the area studied? Was it a more rural region with long response and long transport times which could have contributed to the fatality?

Number three, why do you feel that the data did not support your theory that risky behavior, speed, alcohol, illicit drug use, would increase the risk of scene fatality?

Number four, do you think sample size limited your assessment of hazardous acts such as a contributor to the cause of death?

And, finally, number five, should advocacy efforts expand to include awareness of motorcycles on the highways as part of driver education, training and license renewal? And/or should the use of high visibility gear be advocated for motorcycle operators.

DR. SAUNDERS: Regarding exsanguination, the autopsy reports and the police crash reports were reviewed. The autopsy reports, they are very detailed in discussing how much blood was estimated to be on the scene. So we took that, along with how much blood was measured in the abdominal and chest cavities to decide if hemorrhage was the cause of death. And we got about 25 percent were from hemorrhage only, mostly aortic lacerations. They fell into the hemorrhage category. So I think they are a good portion.

And talking about how rural this is, so I looked into this. 60 percent of ours occurred in Kent County itself, which is the fourth most populous county in Michigan with around 650,000 people in the county. Only one other accident occurred at a higher population at 250,000 people in the county. And the rest occurred in counties that had less than 100,000. And some only have 10,000 people. So definitely a lot of these were in rural areas and likely could have affected how long it took for EMS to get to them and then determine they died. They may have had more time to die between the accident and someone getting to them to declare them dead. Risky behavior, our sample size is quite limited. There's just not a lot of folks who are dying on scene each year, which is good, but I think if we expanded this to include all of Michigan. That would be fantastic. We just have to get more of the medical examiner offices to let us look at their autopsies, and that would be great to increase our sample size.

The risky behavior, I don't know why risky behavior we didn't see that it was significantly higher in our group. We did not look specifically at how high alcohol levels were, because it maybe was not well reported in the autopsy or police crash reports. So we could just say whether there was positive for alcohol or not. We couldn't really comment on how high, so maybe that would affect some of our findings. And then I think advocacy efforts would be fantastic in just getting the word out on the types of injuries you can get from motorcycle accidents. I think a lot of people say, oh, I am just going to die. If I just died, that's okay, but I think it is understood from the hospitalized patients who still have very bad traumatic brain injury, if we focus on that and then encouraging people to wear gear would all be good and decrease the people who actually make it to the hospital.

[☆] Presentation given by Rachel Saunders, M.D.