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Letter to the Editor—Increasing Body Weight of Motorcycle Riders

Sir,

The average weight for men and women in Australia from 1980–2008 (measured by the body mass index [BMI]) has increased by 0.9 and 1.2 kg/m^2/decade, respectively (1). While it is recognized that obesity increases the risk of a range of medical conditions, including hypertension, diabetes mellitus, cardiac disease, and pulmonary thromboembolism (2), the association with injuries is less well appreciated. It has, however, been shown that there is an increased risk of lethal and nonlethal injuries in motor vehicle crashes in obese individuals. This may be influenced by gender, with some studies showing that obese males have the highest risk of death (3,4). Given that the energy involved in an impact is directly proportional to both mass and velocity (squared) (5), it is perhaps not surprising that large unrestrained individuals would be at higher risk of injury. At our forensic facility in Adelaide, SA, we regularly see deaths involving riders and passengers who have been thrown from their motorcycles. To determine whether BMI has increased in this particular group over the past decade, we compared 25 consecutive deaths of motorcyclists subject of coronial autopsies in South Australia from 1999–2001 to a similar number from 2008–2011. There was no significant difference in ages between the two groups (18–62 years, mean 33.9 vs. 18–70 years, mean 39.7; $p = 0.18$). The male-to-female ratio was 23:2 and 24:1, respectively. The BMI range for the earlier group was 20.0–35.2 (mean 27.07, *SD* 4.9), compared with that of the later group where the BMI was higher (range, 20.1–37.7; mean 29.9, *SD* 4.6). Although the numbers are relatively small, the difference did reach statistical significance ($p < 0.05$, Student's *t*-test). In addition, the number of individuals classified as obese (BMI ≥30) in the first group was six, increasing to 13 in the latter group. Given the increase in BMI in the general population, it is not surprising that motorcycle riders' weights have followed a similar trend. However, as motorcycle riders and passengers are at increased risk of unrestrained high-speed impact, an elevated BMI may intensify the energy dissipated in a crash and therefore possibly increase their vulnerability to serious injury or death. Individuals in situations where rapid decelerations may occur should be aware of the potential that obesity, in addition to speed, may have for increasing the force of an impact. More detailed study of such cases may clarify the possible relationship of obesity to the number, nature, and/or severity of injuries in motorcycle riders that will be observed in forensic mortuaries.

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