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Obesity Increases Risk of Death in Severe Vehicle Crashes, Study Shows

Moderately and morbidly obese persons face many health issues -- heart disease, diabetes, hypertension, stroke, gallbladder disease and others. Now, increased chances of dying while driving during a severe auto accident can be added to the list.

In a severe motor vehicle crash, a moderately obese driver faces a 21 percent increased risk of death, while the morbidly obese face a 56 percent increased risk of not surviving, according to a study posted online ahead of print in the American Journal of Emergency Medicine.

Dietrich Jehle, MD, Professor of Emergency Medicine at the University at Buffalo School of Medicine and Biomedical Sciences and at Erie County Medical Center, is first author on the study.

Interestingly, underweight and normal weight drivers were found to be at higher risk of dying from a severe crash than slightly overweight drivers.

"The severity and patterns of crash injuries depend on a complex interaction of biomechanical factors, including deceleration velocity at impact, seat belt and air bag use, vehicle type and weight, and type of impact," says Jehle, "but the effect of body mass on crash outcome has not been previously evaluated in databases of adequate size or controlled for some of these confounding factors.

"Crash test dummies have saved lives and provided invaluable data on how human bodies react to crashes, but they are designed to represent normal-weight individuals. If they represented our overweight American society, there could be further improvements in vehicle design that could decrease mortality."

Based on this data, Jehle suggests several changes that might save lives. "Extending the range of adjustable seats would be helpful, as well as encouraging moderately and morbidly obese individuals to buy larger vehicles with more space between the seat and the steering column".

"We also recommend that manufacturers design and test vehicle interiors with obese dummies, which currently are not available, in addition to testing with the 50 percentile (BMI 24.3) male dummy," he adds. "It would improve safety for the one-third of the U.S. population that is obese. For underweight and normal weight individuals, placing airbags within the seat belt also might be protective."

Jehle and colleagues set out to investigate the relationship between driver body size and risk of crash-related fatality by

analyzing data in the national Fatality Analysis Reporting System database (FARS).

According to FARS, to be included in the database a crash must involve: "A vehicle traveling on a roadway customarily open to the public and must result in the death of an occupant of a vehicle or a non-motorist." From the 168,049 drivers in severe motor vehicle crashes entered in the database, 155,584 met the criteria for inclusion in the analysis.

Drivers were grouped based on body mass index -- weight in kilograms divided by height in meters squared -- into underweight, normal, overweight, slightly obese, moderately obese and morbidly obese categories.

Severe crashes between 2000 and 2005 that involved one or two vehicles (cars, pickups, SUVs or vans) were used in the analysis. Fatalities considered related to the crash that occurred within 30 days of the crash, such as those resulting from surgery, also were included.

In addition to the overall results, data analyzed by sex show that in the moderately and morbidly obese categories, both male and female drivers independently demonstrated a statistically significant increase in death when compared with normal-weight drivers.

"The rate of obesity is continuing to rise, so is it imperative that car designs are modified to protect the obese population, and that crash tests are done using a full range of dummy sizes," Jehle states.

Seth Gemme, a UB medical student, is corresponding author on the paper. Christopher Jehle, a student at Miami University of Ohio, contributed to the study during a UB summer research program.

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Dietrich Jehle, Seth Gemme, Christopher Jehle. Influence of obesity on mortality of drivers in severe motor vehicle crashes. The American Journal of Emergency Medicine, 2010; DOI: 10.1016/j.ajem.2010.10.017