The association between knee airbag deployment and knee-thigh-hip fracture injury risk in motor vehicle collisions: A matched cohort study.

INTRODUCTION: In the U.S. alone, an estimated 30,000 knee-thigh-hip (KTH) injuries occur annually in frontal motor vehicle collisions. These fractures typically occur through occupant contact with the vehicle's knee bolster. Research has suggested that knee airbags (KABs) can mitigate the forces sustained during this contact, resulting in decreased injury risk; however, previous research has been limited by small sample sizes or by occurring in a controlled setting. The objective of the current study is to determine the effectiveness of KABs on KTH fracture risk using nationally representative, real-world data.

METHODS: Using combined data from the Crash Injury Research and Engineering Network and the National Automotive Sampling Survey, a matched cohort study was conducted among front-seat occupants of vehicles involved in a frontal collision occurring from 2000 to 2009. Occupants exposed to a KAB deployment were matched to occupants with no KAB deployment based on age ±5 years, sex, seatbelt use, vehicle seating position (i.e., driver or front passenger), car vehicle body type, collision impact, and sampling weight. A Cox proportional hazards model was used to calculate risk ratios (RRs) and associated 95% confidence intervals (95% CI) to estimate the association between KAB deployment and lower extremity fracture risk.

RESULTS: There was no association between KAB deployment and risk of lower extremity fracture (RR 0.83, 95% CI 0.52-1.31). A notable
pattern in fracture risk, though not statistically significant, was observed, with a decreased risk of hip (RR 0.72, 95% CI 0.26-1.97) and thigh fracture (RR 0.81, 95% CI 0.32-2.05), and an increased risk of tibia/fibula (RR 1.23, 95% CI 0.52-2.90) and foot fracture (RR 1.96, 95% CI 0.72-5.32).

CONCLUSIONS: The results of the current study suggest that KABs are not associated with the risk of lower extremity fractures. However, given the small sample size of the current study, it is difficult to definitively say whether the observed injury pattern is representative of the true pattern.