Abdominal Injury Patterns in Motor Vehicle Accidents – A NASS/CDS Database Analyses

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INTRODUCTION

- Data available on abdominal injuries in real-world motor vehicle accidents equipped with advanced restraint systems are limited.
- Abdominal injuries rank fourth in risk of AIS 3+ for near-side crashes, and fifth for frontal and far-side crashes [1].
- Existing lateral-impact abdominal response data lack reliable abdominal displacement or compression information for human subjects.
- To investigate the risk of abdominal injury and factors associated with it, analyses using crash databases are required.
- The intent of this study was to perform searches related to the scope and severity of abdominal injuries caused by automobile accidents.
- The study also looks into any changes in past trends reported by Klinich et. al [1] where additional years are added to the database analyses.
- This study aims to identify future research that will provide data for improved crash dummies and computational models.

METHODS

- Familiarize with NASS/CDS database and SAS
- Develop SAS codes to conduct basic searches
- Validate results with “Klinich et. al” [1]
- Run analyses with additional data from recent years
- Study the injury patterns and identify areas where further research is required

RESULTS & DISCUSSION

- How many people sustain abdominal injuries each year?
- Does lap/shoulder belt reduce the risk of abdominal injuries?
- Which abdominal organs are commonly injured?
- Does the risk of abdominal injury increase with crash severity / age?
- Are ribs the primary cause of abdominal injuries?

CONCLUSIONS

- The findings of this study are consistent with the results reported by Klinich et. al [2].
- Over 50% of abdominal injuries occur in frontal crashes.
- Right front passengers have a high risk of injury to spleen in all 3 types of crashes.
- Moving forward, the results from database searches and literature review can be combined to better analyze loading conditions.
- A more realistic lateral impact study may be required to develop force-deflection characteristics of the abdomen.
- Abdominal injuries do not always occur in conjunction with rib fractures, emphasizing the need for a separate injury criterion for abdominal organs.

REFERENCES


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