

Injury Characteristics of Cyclist Versus Vehicle Crashes in South Australia

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Abstract

For the 2012 to 2016 period, 21 cyclists were killed on South Australian roads, a further 331 seriously injured and almost 2,500 received minor injuries. Little information is available on the types of crashes that lead to cyclist injuries and the types of injuries incurred. Deeper understanding of the circumstances leading to crash involvement for cyclists is likely to result in more targeted countermeasures. This paper explores the circumstances that lead to injuries for a group of 207 cyclists injured in crashes with another vehicle on public roadways in South Australia. The injury characteristics by the different crash mechanisms are also explored.

Background and Method

For the period July 2015 to December 2017, the Centre for Automotive Safety Research examined all injury records for road crash casualties that presented to the Royal Adelaide Hospital. Of the 2,068 cases, 204 were cyclists involved in a collision with another vehicle. The hospital records for each cyclist were examined in detail and matched to SA Traffic Accident Reporting System (TARS) data. The injuries for these cyclists were coded using the Abbreviated Injury Scale (AIS) - 2005. The injury severity score (ISS) was also determined.

Results

Male cyclists made up 80 per cent of the cases with those aged 40-49 years accounting for 19 per cent. In terms of maximum abbreviated injury score for any body region, 97 per cent of the cyclists sustained at least a MAIS 1+ injury, 68 per cent MAIS 2+ injury and 17 per cent MAIS 3+ injury. For injury severity score, more than 15 per cent of injured cyclists sustained an ISS of 12 or more. The body region most seriously injured was extremities, with 43 per cent of all injured cyclists sustaining an MAIS2+ injury and 5 per cent a MAIS3+ for this body region. Head injuries were also highly represented, with 29 per cent of cyclists sustaining a MAIS2+ injury and eight percent a MAIS3+ injury. In 46 per cent of cases the cyclists spent less than a day in hospital, however, 37 per cent of injured cyclists remained in hospital for 1 to 5 days, 8.1 per cent spent 6 to 10 days and almost 8 per cent were hospitalised for 11 days or more.

Table 1 shows the highest MAIS value for each cyclist for a particular crash type. Right angle crashes accounted for 33 per cent of all cyclist injuries. Half of all right-angle crashes were the result of three right angle crash manoeuvres. In 21 per cent of the right angle crashes the crash was the result of the vehicle pulling out from a side street or driveway on the cyclist's left, 16 per cent occurred at roundabouts where a driver failed to give way to a cyclist and 13 per cent were the result of a driver travelling in the same direction who turned left across a cyclist's path. There were 27 crashes where a cyclist struck a parked car, 13 of which were the result of a door of parked vehicle being opened in front of a cyclist.

Table 1. Crash Type and Injury Severity

Crash Type	Maximum Injury Scale						Total
	0	1	2	3	4	5	
Right angle	2	14	38	12	2		68
Right turn	1	19	19	7	1		47
Side swipe	1	15	23	1	3	1	44
Hit parked vehicle	1	9	17				27
Rear end	1	2	4	4			11
Head on		1	3	2		1	7
Total	6	60	104	26	6	2	204

The majority of cyclist crashes were deemed by police to be the fault of the driver, accounting for 72 per cent, while 22 per cent of cases were deemed the fault of the cyclist (the remainder were unknown). In more than half of cases where the driver was at fault, the driver was undertaking a turning manoeuvre while the cyclist was travelling straight.

Conclusion

The findings of this study have resulted in a greater understanding of the complex circumstances leading to crash involvement for this vulnerable road user group, including the road configurations and infrastructure that render cyclist at greater risk of crash involvement. Utilizing the Safe System approach, this understanding can be applied to the development of more targeted countermeasures that reduce their risk of crash involvement on public roadways and the subsequent injuries incurred.