

ALCOHOL, BICYCLE HELMETS AND HEAD INJURY IN AUSTIN: CASE CONTROL STUDY

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RESULTS

●200 patients age 18 or older were enrolled from December 2006 through November 2007. As expected, helmet use mitigated against brain injury, but alcohol or drug use was a much stronger predictor of head injury (OR=3.6; p<0.01). Impaired riders were less experienced, rarely wore helmets, were more likely to ride at night and in slower speed zones such as city streets, and their hospital charges were double.

Table 1. Characteristics of Study Subjects According to Injury Status

Characteristics	No Head Injury	Head Injury ¹	p-value ²
Patients, No	126	72	
Mean Age (y) – 0 missing	34.5 ± 16.6	36.3 ± 13.9	0.34
Male (%) – 0 missing	103 (81.8)	56 (77.8)	0.50/0.58
Skill Level (%) – 32 missing			
Beginner	12 (11.2)	8 (13.6)	0.40/0.41
Intermediate	53 (49.5)	34 (57.6)	
Expert	42 (39.3)	17 (28.8)	
Helmet Use (%) – 7 missing			
YES	48 (40.0)	22 (31.0)	0.21/0.22
NO	72 (60.0)	49 (69.0)	
Accident Type (%) – 3 missing			
Single Bike	71 (56.8)	46 (65.7)	0.37/0.35
Bike vs. Auto	50 (40.0)	21 (30.0)	
Bike vs. Bike	4 (3.2)	3 (4.3)	
Alcohol or Drug Use (%) – 9 missing			
YES	17 (13.9)	23 (34.3)	0.001/0.001
NO	105 (86.1)	44 (65.7)	
Road Conditions (%) – 23 missing			
Dry	96 (87.3)	60 (92.3)	0.30/0.45
Wet	14 (12.7)	5 (7.7)	
Disposition – 0 missing			
Discharged from ED	114 (90.5)	50 (69.4)	0.001<0.001
Admitted	11 (8.7)	21 (29.2)	
Eloped	1 (0.79)	1 (1.4)	
Mean Hospital Charges (\$) – missing 1	5,247 ± 7,375	17,537 ± 36,751	0.0004
Location (%) – 17 missing			
Street	88 (77.2)	52 (77.6)	0.97/0.98
Off-Road	7 (6.1)	3 (4.5)	
Developed Trail	10 (8.8)	6 (9.0)	
Highway	9 (7.9)	6 (9.0)	
Speed Limit at Location (%) – 55 missing			
0-25 mph	32 (35.2)	23 (44.2)	0.56/0.57
26-45 mph	49 (54.9)	24 (46.2)	
46-65 mph	10 (11.0)	5 (9.6)	
Weather Conditions (%) – 5 missing			
Clear	88 (72.7)	55 (76.4)	0.48/0.58
Cloudy	27 (22.3)	14 (19.4)	
Rainy	6 (5.0)	2 (2.8)	
Foggy	0 (0.0)	1 (1.4)	
Time of Accident (%)			
0501-0900	12 (10.1)	6 (8.5)	0.76/0.79
0901-1600	44 (37.0)	22 (31.0)	
1601-2000	36 (30.3)	23 (32.4)	
2001-0500	27 (22.7)	20 (28.2)	

¹Head injury was defined as any minor (headaches and concussions), mild (GCS 13-15), moderate (GCS 9-12) or severe brain injury (GCS ≤ 8).
²Group means and frequencies were compared by two-sided student t tests or by chi-squared tests/Fisher's Exact test, respectively. Statistical significance was set at p<0.05.

Table 2. Characteristics of Study Subjects According to alcohol and Drug Use

Characteristics	Using Alcohol or Drugs		p-value ¹
	YES	NO	
Patients, No	40	150	
Mean Age (y)	36.6 ± 11.7	34.8 ± 12.6	0.41
Male (%)	32 (80.0)	120 (80.0)	1.00
Skill Level (%)			
Beginner	4 (12.1)	16 (11.9)	0.016
Intermediate	24 (72.7)	63 (47.0)	
Expert	5 (15.2)	55 (41.0)	
Head Injury (%)			
YES	17 (42.5)	105 (70.5)	0.001
NO	23 (57.5)	44 (29.5)	
Accident Type (%)			
Single Bike	26 (66.7)	86 (57.7)	0.59
Bike vs. Auto	12 (30.8)	57 (38.3)	
Bike vs. Bike	1 (2.6)	6 (4.0)	
Helmet (%)			
YES	1 (2.6)	65 (44.2)	<0.0001
NO	38 (97.4)	82 (55.8)	
Road Conditions (%)			
Dry	28 (77.8)	125 (91.2)	0.025
Wet	8 (22.2)	12 (8.8)	
Disposition			
Discharged from ED	33 (82.5)	124 (82.7)	0.75
Admitted	7 (17.5)	24 (16.0)	
Eloped	0 (0.0)	2 (1.3)	
Mean Hospital Charges (\$) – missing 1	14,825 ± 32,631	7,059 ± 9,118	0.011
Location (%)			
Street	38 (97.4)	101 (72.1)	0.009
Off-Road	0 (0.0)	10 (7.1)	
Developed Trail	1 (2.6)	14 (10.0)	
Highway	0 (0.0)	15 (10.7)	
Speed Limit at Location (%)			
0-25 mph	19 (55.9)	36 (33.6)	0.015
26-45 mph	15 (44.1)	56 (52.3)	
46-65 mph	0 (1.0)	15 (14.0)	
Weather Conditions (%)			
Clear	26 (68.4)	114 (77.0)	0.17
Cloudy	8 (21.1)	29 (19.6)	
Rainy	4 (10.5)	5 (3.4)	
Time of Accident (%)			
0501-0900	1 (2.6)	15 (10.3)	<0.0001
0901-1600	3 (7.7)	60 (41.4)	
1601-2000	11 (28.2)	46 (31.7)	
2001-0500	24 (61.5)	24 (16.6)	

¹Means and frequencies were compared by two-sided student t tests and chi-squared tests, respectively. Statistical significance was set at p<0.05.

Objective

●To examine the interactions between bicycle helmet use, alcohol and drug use, experience level, riding environment, head and brain injury, and hospital charges in a medium-sized city without an adult helmet law.

MATERIALS AND METHODS

●A prospective cohort study of adult bicycle accident victims presenting to a regional trauma center over a one-year period. Data was collected at the bedside regarding helmet use, alcohol or drug use, experience level, location and type of accident and prevailing vehicle speed (for road accidents), and presence and degree of head or brain injury.

CONCLUSIONS

●Alcohol and drug use leads to a host of unsafe bicycling practices and increased injuries and costs to the cyclist and community. The interrelated characteristics of the riding patterns of the impaired might help target interventions.