

Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.

eTable 1. Comparison of Patients Who Consented for Follow-Up vs Those Who Did Not

	Eligibility and consent status		P-value
	Waiver of consent (N = 228)	Consented (N = 372)	
Age at injury			0.301 ¹
5 - 12 years old	57 (25.0%)	108 (29.0%)	
13 - 18 years old	171 (75.0%)	264 (71.0%)	
Sex			0.064 ¹
Male	116 (50.9%)	160 (43.0%)	
Female	112 (49.1%)	212 (57.0%)	
Total number of comorbidities (excluding seizures)			0.586 ²
0	51 (22.4%)	84 (22.6%)	
1	76 (33.3%)	122 (32.8%)	
2	25 (11.0%)	45 (12.1%)	
3 or more	23 (10.1%)	45 (12.1%)	
Unknown	53 (23.2%)	76 (20.4%)	
¹ Fisher's exact test. ² Kruskal-Wallis test.			

eTable 2. Comparison of Patients with Complete Data vs Those Who Were Lost to Observational Follow-Up

	Respond		P-value
	No (N = 73)	Yes (N = 271)	
Age at injury			0.240 ¹
5 - 12 years old	16 (21.9%)	80 (29.5%)	
13 - 18 years old	57 (78.1%)	191 (70.5%)	
Sex			0.894 ¹
Male	30 (41.1%)	116 (42.8%)	
Female	43 (58.9%)	155 (57.2%)	
Total number of comorbidities (excluding seizures)			0.008 ²
0	8 (11.0%)	71 (26.2%)	
1	21 (28.8%)	90 (33.2%)	
2	13 (17.8%)	30 (11.1%)	
3 or more	10 (13.7%)	31 (11.4%)	
Unknown	21 (28.8%)	49 (18.1%)	
¹ Fisher's exact test. ² Kruskal-Wallis test.			

eTable 3. Event Characteristics by Sex

	Sex		Overall (N = 600)	P-value
	Male (N = 276)	Female (N = 324)		
Time to initial clinic visit (days)				0.876 ¹
N	276	324	600	
Median [Q1, Q3]	16.5 [8.5,29.0]	16.0 [8.0,29.0]	16.0 [8.0,29.0]	
Definite reported mechanism of injury				0.517 ²
Yes (There was a discrete event with force to the head or rapid head movement without impact)	271 (98.2%)	315 (97.2%)	586 (97.7%)	
No (There was no discrete event)	3 (1.1%)	6 (1.9%)	9 (1.5%)	
Unknown	2 (0.7%)	3 (0.9%)	5 (0.8%)	
Gradual recovery of symptoms over the first week of the injury				0.001 ²
Yes (There have been improving symptoms over the first week)	164 (59.4%)	142 (43.8%)	306 (51.0%)	
Yes (There have been stable symptoms over the first week)	88 (31.9%)	143 (44.1%)	231 (38.5%)	
No (There have been worsening symptoms over the first week)	21 (7.6%)	32 (9.9%)	53 (8.8%)	
Unknown	3 (1.1%)	7 (2.2%)	10 (1.7%)	
Alternative explanation for the acute onset of symptoms				0.766 ²
Yes (acute alternative conditions: migraine, cervical injury, heatstroke, syncope, panic attack, intercurrent illness, etc)	20 (7.2%)	30 (9.3%)	50 (8.3%)	
No (concussion is the only likely cause for the acute onset of symptoms)	241 (87.3%)	278 (85.8%)	519 (86.5%)	
Unknown	2 (0.7%)	4 (1.2%)	6 (1.0%)	
Mechanism/cause of injury				0.366 ²
Motor vehicle crash (MVC)	11 (4.0%)	17 (5.2%)	28 (4.7%)	
Assault	6 (2.2%)	6 (1.9%)	12 (2.0%)	
Struck by or against object/person (non-assault, non-sport)	20 (7.2%)	35 (10.8%)	55 (9.2%)	
Fall (non-sport)	26 (9.4%)	21 (6.5%)	47 (7.8%)	
Sport/Recreation	210 (76.1%)	242 (74.7%)	452 (75.3%)	
Unknown	3 (1.1%)	3 (0.9%)	6 (1.0%)	
Retrograde Amnesia	39 (14.1%)	40 (12.3%)	79 (13.2%)	0.390 ²
Anterograde Amnesia	61 (22.1%)	55 (17.0%)	116 (19.3%)	0.091 ²

	Sex		Overall (N = 600)	P-value
	Male (N = 276)	Female (N = 324)		
Loss of consciousness	39 (14.1%)	30 (9.3%)	69 (11.5%)	0.052 ²
¹ Wilcoxon rank-sum test. ² Fisher's exact test.				

eTable 4. Event Characteristics by Age

	Age Category		Overall (N = 600)	P-value
	5 - 12 years old (N = 165)	13 - 18 years old (N = 435)		
Time to initial clinic visit (days)				0.736 ¹
N	165	435	600	
Median [Q1, Q3]	17.0 [9.0,29.0]	16.0 [8.0,29.0]	16.0 [8.0,29.0]	
Definite reported mechanism of injury				1.000 ²
Yes (There was a discrete event with force to the head or rapid head movement without impact)	162 (98.2%)	424 (97.5%)	586 (97.7%)	
No (There was no discrete event)	2 (1.2%)	7 (1.6%)	9 (1.5%)	
Unknown	1 (0.6%)	4 (0.9%)	5 (0.8%)	
Gradual recovery of symptoms over the first week of the injury				0.467 ²
Yes (There have been improving symptoms over the first week)	90 (54.5%)	216 (49.7%)	306 (51.0%)	
Yes (There have been stable symptoms over the first week)	57 (34.5%)	174 (40.0%)	231 (38.5%)	
No (There have been worsening symptoms over the first week)	14 (8.5%)	39 (9.0%)	53 (8.8%)	
Unknown	4 (2.4%)	6 (1.4%)	10 (1.7%)	
Alternative explanation for the acute onset of symptoms				0.537 ²
Yes (acute alternative conditions: migraine, cervical injury, heatstroke, syncope, panic attack, intercurrent illness, etc)	14 (8.5%)	36 (8.3%)	50 (8.3%)	
No (concussion is the only likely cause for the acute onset of symptoms)	145 (87.9%)	374 (86.0%)	519 (86.5%)	
Unknown	2 (1.2%)	4 (0.9%)	6 (1.0%)	
Mechanism/cause of injury				<.001 ²
Motor vehicle crash (MVC)	8 (4.8%)	20 (4.6%)	28 (4.7%)	
Assault	4 (2.4%)	8 (1.8%)	12 (2.0%)	
Struck by or against object/person (non-assault, non-sport)	25 (15.2%)	30 (6.9%)	55 (9.2%)	
Fall (non-sport)	26 (15.8%)	21 (4.8%)	47 (7.8%)	
Sport/Recreation	100 (60.6%)	352 (80.9%)	452 (75.3%)	
Unknown	2 (1.2%)	4 (0.9%)	6 (1.0%)	
Retrograde Amnesia	17 (10.3%)	62 (14.3%)	79 (13.2%)	0.483 ²
Anterograde Amnesia	35 (21.2%)	81 (18.6%)	116 (19.3%)	0.187 ²

	Age Category		Overall (N = 600)	P-value
	5 - 12 years old (N = 165)	13 - 18 years old (N = 435)		
Loss of consciousness	23 (13.9%)	46 (10.6%)	69 (11.5%)	0.142 ²
¹ Wilcoxon rank-sum test. ² Fisher's exact test.				

eTable 5. Acute Injury Severity Surrogates

	Overall (N = 600)
Imaging done	
CT and MRI	9 (1.5%)
CT	105 (17.5%)
MRI	14 (2.3%)
Unknown	35 (5.8%)
None	434 (72.3%)
Unknown	3 (0.5%)
Findings of the CT	(N=114)
Normal	92 (80.7%)
Abnormal	18 (15.8%)
Unknown	4 (3.5%)
Findings of the MRI	(N=23)
Normal	18 (78.3%)
Abnormal	5 (21.7%)
Retrograde Amnesia	
No	444 (74.0%)
Yes	79 (13.2%)
Unknown	77 (12.8%)
Length of retrograde amnesia	(N=79)
≤ 1 minute	8 (10.1%)
> 1 minute - 20 minutes	4 (5.1%)
> 20 minutes - 1 hour	9 (11.4%)
> 1 hour - 24 hours	11 (13.9%)
> 1 day - 7 days	8 (10.1%)
More than 7 days	12 (15.2%)
Unknown	27 (34.2%)
Anterograde Amnesia	
No	410 (68.3%)
Yes	116 (19.3%)
Unknown	74 (12.3%)
Length of anterograde amnesia	(N=116)

	Overall (N = 600)
≤ 1 minute	8 (6.9%)
> 1 minute - 20 minutes	18 (15.5%)
> 20 minutes - 1 hour	16 (13.8%)
> 1 hour - 24 hours	18 (15.5%)
> 1 day - 7 days	12 (10.3%)
More than 7 days	10 (8.6%)
Unknown	34 (29.3%)
Loss of consciousness (LOC)	
No	472 (78.7%)
Yes	69 (11.5%)
Unknown	59 (9.8%)
Length of LOC (N=69)	
Less than 1 minute	38 (55.1%)
Between 1-5 minutes	14 (20.3%)
Greater than 5 minutes	5 (7.2%)
Unknown	12 (17.4%)

CT: computerized tomography; MRI: magnetic resonance imaging

eTable 6. Sex and History of Emotional Distress Interaction

Obs	Parameter	ClassVal0	ClassVal1	DF	Estimate	StdErr	ChiSq	ProbChiSq	HazardRatio	Label
1	Gender	Female		1	-0.12998	0.22861	0.3233	0.5697	.	Gender Female
2	History of Emotional Distress	No		1	0.34848	0.20439	2.9070	0.0882	.	Mental Distress No
3	Gender*History of Emotional Distress	Female	No	1	-0.05769	0.25940	0.0495	0.8240	.	Gender Female * Mental Distress No

eTable 7. Sex and History of Migraine Interaction

Obs	Parameter	ClassVal0	ClassVal1	DF	Estimate	StdErr	ChiSq	ProbChiSq	HazardRatio	Label
1	Gender	Female		1	-0.42414	0.30227	1.9690	0.1606	.	Gender Female
2	HistoryMigraines	No		1	0.33680	0.25738	1.7123	0.1907	.	Migraines No
3	Gender*HistoryMigraines	Female	No	1	0.21084	0.32383	0.4239	0.5150	.	Gender Female * Migraines No