

Traumatic Brain Injury in the under and over 65's: Is there a difference?

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Introduction:

Traumatic Brain Injury (TBI) is defined as an alteration in brain function, or other evidence of brain pathology, caused by an external force¹. TBIs affect all ages and are associated with significant disability and mortality². The aim of this study was to understand the potential differences between those aged under- and over-65 years presenting to a large urban emergency department (ED).

Methods:

A cross-sectional study was conducted over a 5-year period (2013 to 2017). TBI patients were identified on CT brain imaging. Data was collected on age, gender, severity of presentation based on Glasgow Coma Scale (GCS), mechanism of injury, intoxication status, exacerbation factors, time of presentation and ECG results. Categorical data were compared using Chi-Square tests.

Results:

476 eligible TBI patients were identified with a median age of 56 (IQR=43). The incidence rate of TBI was 359/100,000 population per year. 40% (n=190) patients were over 65 years old. Male TBI patients represented 67.4% (n=321) of presentations. Significant differences in all characteristics of presentation examined were found between the two age groups as highlighted in *Table 1*.

	Age group		All patients:	Significance (Chi-square test), p-value
	<65 years	≥ 65 years		
N	286 (60.08%)	190 (39.92%)	476	
Sex	3.93:1	0.96:1	2.08:1	p<0.001
- Male	228 (79.72%)	93 (48.95%)	321 (67.44%)	
- Female	58 (20.28%)	97 (51.05%)	155 (32.56%)	
Severity:				p=0.003
- Mild (13-15)	203 (70.98%)	160 (84.21%)	363 (76.26%)	
- Moderate (9-12)	40 (13.99%)	17 (8.95%)	57 (11.97%)	
- Severe (<8)	43 (15.03%)	13 (6.84%)	56 (11.76%)	
Mechanism of Injury				p<0.001
- Fall (LVF*)	104 (36.3%)	157 (82.6%)	261 (54.8%)	
- Assault	79 (27.62%)	5 (2.63%)	84 (17.65%)	
- Road Traffic Collision	58 (20.28%)	5 (2.63%)	63 (13.24%)	
- Other	45 (15.7%)	23 (12.1%)	68 (14.3%)	
*LVF: low velocity fall.				
Predisposing factors				p<0.001
- Intoxication	162 (56.6%)	43 (22.6%)	205 (43.1%)	
Exacerbating factors				p<0.001
- None	268 (93.7%)	86 (45.3%)	354 (74.4%)	
- Bleeding disorder	18 (6.3%)	104 (54.7%)	122 (25.6%)	
ECG				p<0.001 p<0.001 p<0.001 p=0.016 p=0.004
- Absent	169 (59.09%)	39 (20.53%)	208 (43.7%)	
- Present	117 (40.91%)	151 (79.47%)	268 (56.3%)	
• Normal	85 (72.65%)	58 (38.41%)	143 (53.36%)	
• Abnormal	32 (27.35%)	93 (61.59%)	125 (46.64%)	
• Atrial fibrillation	0 (0%)	21 (19.9%)	21 (7.8%)	
• Prolonged QT	22 (18.8%)	48 (31.8%)	70 (26.1%)	
• Block	15 (12.8%)	41 (27.2%)	56 (20.89%)	
Hour of presentation:				p<0.001
- In hours	91 (31.8%)	107 (56.3%)	198 (41.6%)	
- Out of hours	195 (68.2%)	83 (43.7%)	278 (58.4%)	

Table 1: Characteristics of under- and over-65's presenting with TBI

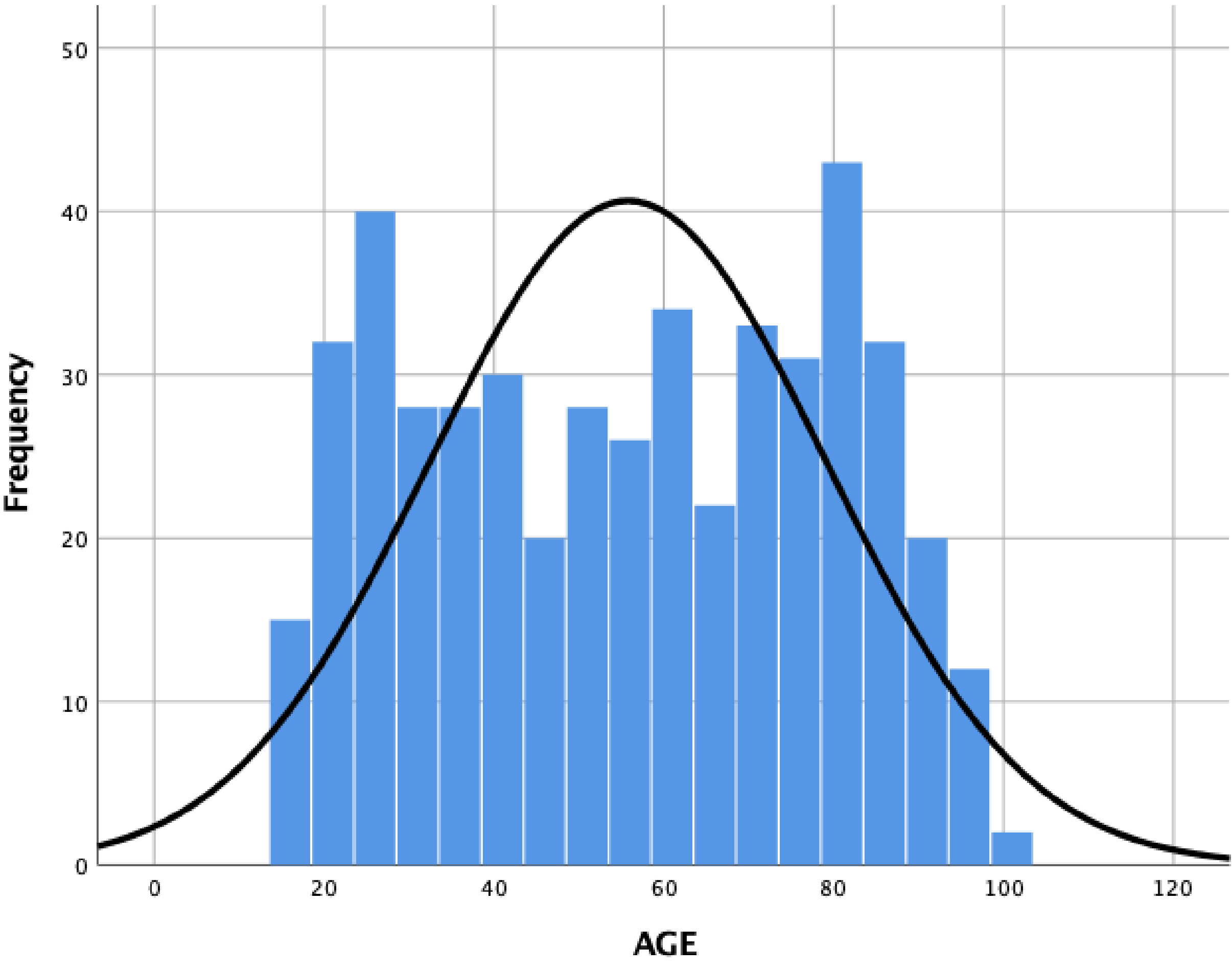


Figure 1. Age distribution of patients presenting with TBI

Discussion:

Two distinct subgroups coexist within the TBI patient population: the under 65s and over 65s (*Figure 1*). The younger population are more likely to present intoxicated with severe injuries resulting from falls, assaults and RTC. In contrast, older patients present with milder injuries resulting from LVF, which may be caused or exacerbated by arrhythmogenic³ or bleeding disorders, respectively. As well as biological factors, the dichotomy seen in presenting patients may result from the contrasting older residential and younger nightlife populations present in our ED's catchment area.

Conclusion:

Intrinsic patient factors (e.g. undetected arrhythmogenic disorders) emerge with advancing age, resulting in falls becoming the predominant aetiology of TBI in the older population. In contrast, extrinsic factors (e.g. assault, RTC and intoxication) are the major causative factors of TBI in the younger TBI group.

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References:

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