Northumbria Low Energy Trauma Score

NHS North East Ambulance Service NHS Foundation Trust

NORTHERN TRAUMA NETWORK NTN

Introduction

It is acknowledged that older adult major trauma is complex and challenging when attempting to identify those who require early identification to influence their ongoing care and prevent a fatal outcome. There is also a clear need to develop an older adult/low energy trauma triage tool/score to support clinical decision making for those clinicians that are seldom exposed to trauma. This is now more important than ever due to a significant increase in the volume of older adults who have a high Injury Severity Score (ISS) (Kehoe et al., 2015b) which is described as the *'The grey tsunami'* by Rehn (2013).

Method

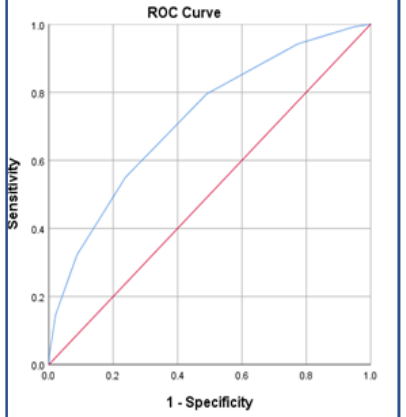
A retrospective analysis of data from TARN was undertaken for the period between 1 April 2012 and 31 March 2017. Patients entered into the database had experienced trauma and admitted to hospital for more than 72 hours and/or required critical care or died from their injuries. To develop a predictive model a binary logistic regression analysis was undertaken with mortality as the outcome (adjusting for collinearity and potential amplification bias). Only independent variables that were associated with mortality where a p value of ≤ 0.05 was predetermined as the level of significance were entered into the binary logistic regression model.

Results

A ROC curve generated a significant positive result for our predictive model using the Northumbria Low Energy Trauma Score. The sensitivity, specificity and predictive values were calculated for each threshold score all of which were statistically significant but may potentially be improved by additional independent variables (comorbidities, frailty, and medications).

Conclusions

As a predictive model, the Northumbria low energy Trauma Score combines prehospital GCS <15, head injury, age groups (<65 and >65 years), prehospital SBP <110mmHg, gender, spinal injury, chest injury and multiple injuries which were found to be predictive of mortality in prehospital low energy trauma. This is believed to be especially applicable to the older adult at high risk of mortality from trauma and may be improved with addition of comorbidities, frailty, and medications as independent variables. There is real potential to ultimately save life with regards to older adults who are described as stealth trauma as they are silent and hidden with fatal consequences. The Northumbria Low Energy Trauma Score may raise awareness of those at risk and expedite their ongoing management to a senior clinical decision maker within the ED. As such a smartphone app has been developed to assist in prehospital assessment of low energy trauma.



ROC Curve for NLETS Sore with outcome as 'deceased'

Variable	SPSS Code
Older age (Recoded as)	<65 years ≥65
Deranged physiology	
GCS (Prehospital)	≤14
SBP (Prehospital)	<110 ≥110
Respiration Rate (Prehospital)	<10, 10-30, >30
Comorbidities[1]	Not in TARN[1]
Anticoagulant/platelet[1]	Not in TARN[1]
Injuries	
Head injury	Yes/No
Chest injury	Yes/No
Spinal injury	Yes/No
Multiple injuries	Yes/No
Frailty[1]	Not in TARN[1]
Male	Yes/No
Polypharmacy[1]	Not in TARN[1]
MTC	Yes/No
Ventilatory support	Yes/No
Mechanism[2]	
Recorded as	High/Low Energy[2] RTC, Falls (+/-2m), Other
Other indices	
BMI[1]	Not in TARN[1]
Acidosis[1]	Not in TARN[1]
White[1]	Not in TARN[1]

Identified potential prediction variables

Northumbria Low Energy Trauma Score

Indices/Score	0	1	2	3	4	5
Age (years)	<65			65-74	75-84	85+
Gender	Female	Male				
Head injury	No	Yes				
Chest injury	No	Yes				
Spinal injury	No	Yes				
Multiple injuries	No	Yes				
GCS	15	14	13	≤12		
SBP (mmHg)	≥110	110 - 90	<90			
Lactate (mmol/l)	0-1	2-3	4-5	6-7	8-9	10+
Comorbidities (number)	0	1	2	3	4+	
Medications (number)	0	1-2	2-4	5+		
Anticoagulants /antiplatelet	No	Yes				
Frailty score	1-2	3	4-5	6	7	8-9
BMI	Normal	Under/over weight	Obese	Morbidly obese		

Extended Northumbria Low Energy Trauma Score

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