Investigating the Effectiveness of Kampala Trauma Score (KTS) in Comparison to Trauma and Injury Severity Score (TRISS) in Fall from Height Patients

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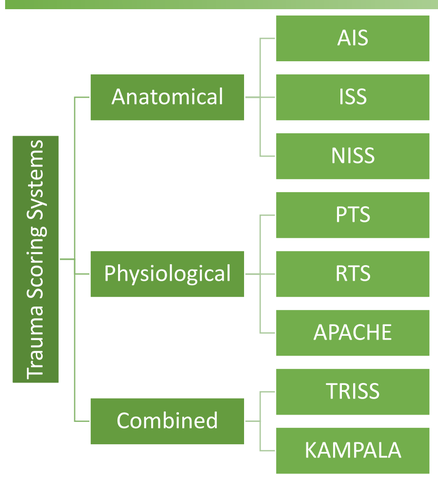
Introduction



Falling from a height (FFH) constitutes a very important public health problem for our country, as it is one of the most common causes of admission to the emergency department. It is the most common cause of trauma and mortality in adults after traffic accidents, occur most frequently due to work related accidents and suicide. The grading of injuries resulting from trauma is very significant in determining the severity of the trauma. Therefore, many scoring systems have been developed from the past to the present in the grading and classification of damages. The general condition of patients falling from a height is critical, so using a reliable scoring system and calculating this score immediately is of great importance for the prognosis of the patient. The aims of this study are; to investigate characteristics of fatalities and predictors of mortality in FFH patients and to test the effectiveness and applicability of 2 trauma scores for specifically FFH patients.

Materials and Methods

This research was carried out retrospectively from the data of 81 patients. Demographic characteristics, comorbidities, laboratory test data, vital parameters and physical examination data were recorded in the prepared forms. Height fallen, reason of fall, fallen site, affected body part, organ damage and the prognosis of the patient were also recorded. The excluded groups were: Missing data, ground-level falls, transferred patients. KTS and TRISS were calculated for each patient. Shapiro-Wilk and Kolmogorov-Smirnov tests were used for normal distribution testing. A Spearman's correlation was run to determine the relationship between KTS and TRISS of the patients.

TRISS calculation formula

$Ps = 1/1 + e^{b}$ where

$b = b_0 + b_1(RTS) + b_2(ISS) + b_3(age)$

and where

RTS = Revised Trauma Score value
ISS = Injury Severity Score value
Age = age < 55 = 0 or age > 55 = 1
e = 2.7183 (natural log base)

Regression coefficients (from 1987 MTOS)

Injury	b_0	b_1	b_2	b_3
Blunt trauma	–1.2470	0.9544	– 0.0768	– 1.9052
Penetrating trauma	– 0.6029	1.1430	– 0.1516	– 2.6676

Table 1 Components of the Kampala Trauma Score

Component	Score
Age (years)	
5–55	2
<5 or >55	1
Systolic blood pressure (mmHg)	
>89	4
50–89	3
1–49	2
Undetectable	1
Respiratory rate (/min)	
10–29	3
>30	2
<9	1
Neurologic status	
Alert	4
Responds to verbal stimuli	3
Responds to painful stimuli	2
Unresponsive	1
Serious injuries	
None	3
1	2
≥2	1
Total score	5–16

Results

26 (32.1%) females and 55 (67.9%) males with a mean age of 28 (range, 1 to 88) are included in this study. 38 (46.9%) patients fell from 1 meter (m) and less, 40 (49.4%) patients fell from 1.1m-4m , 2 (2.5%) patients fell from 4.1m-9m, and 1 (1.25%) patient fell from height greater than 9 meter. Almost 75% of falls occurred in afternoon hours. 91.4% of the falls were accidental, 7.4% of the falls were work-related and 1.2% of the falls were related to suicide. 73 (90.4%) patients sustained only one system injury, and 8 (9.6%) patients had multisystem injury. Major injuries included head trauma (32%), musculoskeletal trauma (38.1%), thorax trauma (18.4%), abdominopelvic trauma (12.2%), and spinal trauma (9.8%). There was strong positive correlation between KTS and TRISS ($r=0.795$, $p<0.001$).

P#	AGE	SEX	AGE INTERVAL	CHRONIC DISEASE	SBP	HR	RR	SAT	AVPU	REASON OF FALL	HEIGHT FALLEN	TIME OF FALL	# OF INJURIES	HG	HTC	PLT	AST	ALT	CRP	CRE	WBC	GCS	RESULT	TRISS	KAMPALA
1	77	1	2	11	190	78	17	89	3	0	2	3	9	10	29	198	102	55	8	1,1	13	5	3	2,57	5
2	69	1	2	2	147	88	17	96	0	0	1	2	5	12	35	197	35	63	4	0,8	9	15	1	97,84	8

Discussion & Conclusion

We found that KTS is as effective as TRISS in predicting the mortality of FFH patients. FFH patients are in critical condition therefore a practical, easily calculable score such as KTS can be used instead of TRISS in the emergency departments. Nonetheless, these results must be interpreted with caution and a number of limitations in mind. We were unable to do a ROC (receiver operating characteristic) curve in our research because the data was limited to our hospital only and mortality rate was just 0.037%. A bigger sample size would provide more precise results for our study. That is why we suggest that multiple hospital-based studies should be held in order to reach a bigger sample of fatal cases and therefore, more accurate findings.

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