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Submitting author: Dr Margaret YUEN

Post title: Nurse Consultant, PYNEH, HKEC

Develop a new trauma score for trauma triage in Accident and Emergency

Department of PYNEH

Yuen MSY (1), Chow DHK (2)

(1) Department of Accident and Emergency, Pamele Youde Nethersole Eastern Hospitals, (2) Department of Health and Physical Education, Education University of Hong Kong

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Introduction

Trauma scores were developed in the 80s and have been used in assessing injury severity and predicting mortality of the injured by the trauma registries, they were not used in Accident and Emergency Department (A&E) because of data availability and ease of coding issues.

Objectives

To develop a trauma score for trauma triage in A&E

To test the applicability of trauma score for trauma triage and predictive ability with mortality in A&E

Methodology

Retrospective analysis of trauma patients from Hong Kong East Cluster Trauma Registry was conducted. Trauma score (mSET) was developed from the trauma database of 2007 to 2009 and validated from 2010 to 2011. Potential parameters in predicting mortality were identified by univariate analysis (T-test and Chi-square test). Mortality analysis was used to develop the equation of mSET, which was compared with commonly used trauma scores using the area under receiver operating characteristic curves (AROC).

Pilot study was carried out from January 6th to February 24th 2017, training and Q Card were provided to nurses who were interested in the study. T-test, correlation, AROC and mortality were employed in analysis.

Result

There were 1057 and 850 patients' records used in developing and validating the mSET. Four parameters: Age, Glasgow Coma Scale (GCS), Respiratory Rate (RR) and Injury were identified; all had equal weighting. Score by summation. One point would be added if the injured turned out having the parameters of 1) Age 60 or above, 2) GCS of 3 to 8, 3) RR is less than 11 breaths/ minute and 4) suspect of having the listed anatomical injuries. The score ranged from 0 to 4.

At cut-off point 2, the sensitivity and specificity of mSET were 65% and 95%. The positive predictive value and negative predictive value was 0.47 and 0.98. The percentage of accuracy was 94.4. The AROC was 0.896, which was comparable with RTS, ISS and TRISS (0.853, 0.914, and 0.962). Thus at point 2 or above, the injured was considered serious and should be triaged at either Critical or Emergency. In application, there were 10 staffs participated and 135 patients recruited in the pilot study. In triage category analysis, it was noted that mSET was marginally and negatively correlated with triage category of the injured ($r = -0.391$, $p < 0.01$). Not all the injured with mSETs of 2 or above were triaged at Critical and Emergency, approximately 71% of them were triaged appropriately. In mortality analysis, it was noted that mSET was directly proportional to the prediction of mortality; the AROC was 0.991. Nurses with less than two years of experience in A&E particularly found mSET useful and practical.

In conclusion, the new trauma score (mSET) contains both anatomical and physiological components, all are obtainable in Triage. It is considered a relevant trauma score for trauma triage in A&E.