FACTORS AFFECTING MORTALITY IN MAJOR TRAUMA PATIENTS IN TRINIDAD AND TOBAGO—A VIEW FROM THE DEVELOPING WORLD

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INTRODUCTION

Little is known about the characteristics that influence or impact on mortality rate in major trauma in the developing world. Injuries are a neglected epidemic in developing countries, [1, 2] * causing more than five million deaths each year, roughly equal to the number of deaths from HIV/AIDS, malaria and tuberculosis combined. The seminal paper *'The Global burden of disease and risk factors'* estimated that injuries accounted for more than 15% of all ill-health in the world in 1990 and forecast this to increase to 20% by 2020. In 2004, , trauma related deaths were the 5th leading cause of mortality in Trinidad and Tobago and accounted for 9.2% of all deaths (18) .

Identification of factors that influence mortality after trauma has been addressed by many researchers (6 -9). Champion et al and Boyd et al originally described the effects of age, injury severity, physiological status and mechanism of injury on mortality in major trauma patients . From this research, the TRISS methodology for predicting mortality rates among populations of major trauma patients was developed. Subsequent authors have identified other factors that may impact on trauma mortality, including gender, comorbidities and pre-existing medication. However, the degree to which predictive models for trauma mortality are transferrable from one country to another is not clear. Specifically, predictive models created in the developed world have performed variably when applied to developing countries.

While data on the epidemiology, effectiveness and economic impact of many health conditions (such as infectious and nutritional disorders) are available for developing countries, such information is lacking in relation to injuries and their management. This study investigated the impact of age, gender, co morbidities , mechanism and pattern of injury on mortality and assessed the predictive accuracy of the TRISS methodology in major trauma patients in Trinidad.

METHODOLOGY

A retrospective single-centre observational study was performed at the Emergency Department (ED) of a tertiary centre in Trinidad from June 2010 to April 2014. Major trauma patients aged 18 years and older admitted to the ED with an Injury Severity Score (ISS) of greater than 15 (CTAS levels 1 and 2) were included. The impact of age, gender, co morbidities, mechanism and pattern of injury on mortality were investigated. Using TRISS methodology, predicted mortality was calculated and compared to actual mortality.

RESULTS

Of 323 patients analysed, 284 were male and 24 were aged ≥65 years. The mortality rate for the entire cohort of patients was 7.7% (95% CI 4.8% - 10.7%); with a significantly higher mortality among older compared to younger patients (37.5% vs. 5.4%; *'p' < .001*). Younger patients were mainly injured by road traffic accidents (RTAs) (34.1%); stab wounds (30.8%) and gunshot wounds (11.4%), while older patients were injured by falls (66.7%) and RTAs (20.8%). Younger patients were more likely to suffer serious chest injuries compared to older patients (80.3% vs. 50.0%; *'p' = .001*), but less likely to suffer serious head injuries (13.6% vs. 50.0%, *'p' < .001*). Men were more likely to suffer serious thoracic injuries (81.3% vs. 53.8%; *'p' = .002*) and less likely to suffer serious extremity injuries (22.2% vs. 38.5%, *'p' = .044*) compared to women. The TRISS model distinguished those with a higher chance of survival from those with a lower chance of survival and the discrimination statistic for the model was 0.94.

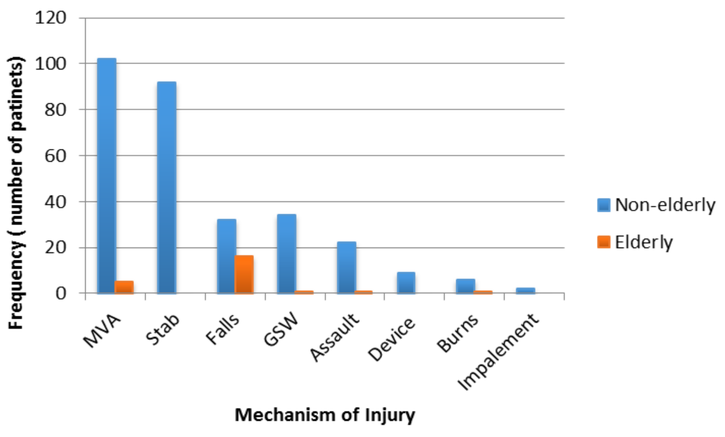

Figure 1: Frequency of different mechanisms of injury among elderly and non-elderly adults

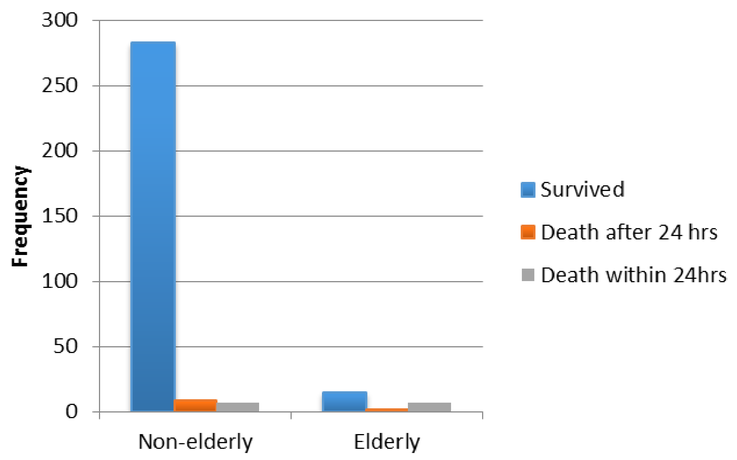

Figure 2: Bar chart illustrating the number that survived, died after 24 hours and died within 24 hours in each age group

CONCLUSION

Increased age, blunt trauma, ISS≥25 and increasing RTS were factors found to be associated with increased risk of mortality in major trauma patients in Trinidad and Tobago. The TRISS model in this study was found to be an excellent discriminator between those who had a high chance of survival to those who had a low probability of survival. A multi-center trial is required for validation of trauma prediction tools such

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