Trauma scoring system in ICU patient

An Essay

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In Intensive care medicine

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Injury is a global public health problem and the dominant cause of morbidity and mortality. Injury is the seventh cause of death worldwide and the number one cause of death in the young in the United States.

The most common mechanisms of injury admitted to the Trauma Center are Intentional Injury (Assault, Firearm, Stab), Falls, Motor Vehicle Collisions and Motorcycle Crashes. ***(Peden,etal,.٢٠٠٣)***

The concept of grouping patients according to severity of their illness and so patient care could be made more efficient because equipment and specially trained personnel could be grouped and located appropriately. Also during this time, the rapid development of new procedures and equipment made the need for grouping critically ill medical patients more apparent. ***(Berenson,.١٩٨٤)***

Scoring systems were designed initially to categorize patients with single, specific diagnoses into risk and prognosis groups. all the scoring systems assess the severity of illness and the likelihood of in-hospital mortality. Of arguably more importance is the ability to predict outcome or morbidity after discharge from ICU. ***(Ridley, eta,l.١٩٩٨)***

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List of Abbreviations

AIS	Abbreviated injury scale.
AP	Anatomic profile.
APACHE	Acute physiology and chronic health evaluation.
APS	the Acute Physiology Score
ASCOT	A severity characterization of trauma.
Cr	Creatinine
CVP	Central venous pressure.
Dopa	Dopamine.
Epi	Epinephrine
GCS	Glasgow Coma Scale score.
GI	Gastrointestinal tract.
GSW	Gunshot Wounds.
HR	Heart rate.
ICISS	ICD-based Injury Severity Score.
KE	Kinetic energy.
LODS	Logistic Organ Dysfunction System.
MAP	Mean arterial pressure.
mg	milligram(s).

MISS Modified Injury Severity Scale.

mL milliliter(s).

MODS Multiple organ dysfunction syndrome

MOF Multiple organ failure.

MPM Mortality Prediction Model.

NE Noradrenalin.

NISS New Injury Severity Score.

paO٢ Arterial plasma partial pressure (concentration) of oxygen.

PATI Penetrating Abdominal Trauma Index.

PH The negative logarithm of the hydrogen ion concentration.

PICU pediatric intensive care unit.

PIM Pediatric Index of Mortality

Ps probability of survival.

PRISM Pediatric Risk of Mortality.

RR Respiratory rate

RTA Road traffic accidents .

RTS Revised trauma score.

SAH Subarachnoid hemorrhage.

SAPS Simplified acute physiology score.

SBP	Systolic Blood Pressure.
SOFA	Sequential Organ Failure Assessment.
TS	Trauma score
TRISS	Trauma Score - Injury Severity Score.
UO	Urine output.
µg	Microgram(s).

Introduction

Major injury is a leading cause of death and disability around the world. For both sex, one in every ten death is the result of injury .Globally, unintentional injuries are ranked as the sixth leading cause of death and the fifth leading cause of moderate and sever disability. **(WHO,.٢٠٠٩)**

Many scoring systems have been developed to measure or predict severity or outcome of trauma ,intensive care unit result, mortality, morbidity and development of complication**.** ***(Baueae,.*** *٢٠٠٧)*

A score that may indicate the chance of mortality shortly after admission can be useful to become aware of severity of trauma and might influence further therapeutic decisions **.** Trauma is most common cause of non obstetric morbidity and mortality in pregnancy and complicates at least ٦% to ٧% of all pregnancies (**El-Kady,.٢٠٠٤).**

Maternal death rates from trauma may be noted as high as ١٠% to١١%. Death to the fetus is reported to be even higher than death of the mother from traumatic injuries. With trauma, fetal mortality is as high as ٦٥%. Traumatic injuries the leading cause of a major of disability among children. **(Rodriguez, .١٩٩٠)**

Inadequate evaluation, resulting in inappropriate treatment, may contribute in approximately ٣٠%of early death in child with severe trauma **(Mazurek,.١٩٩٤)** In contrast, prompt and accurate assessment of the severity of injury and early initiation of critical care is of crucial importance for preventing these deaths **(Inaba ,et al,.٢٠٠٣)**

Elderly trauma patients represent an important clinical sub-group and pose significant challenges to both acute and long-term care. Co morbidity, use of multiple medications, frail anatomies and a reduced physiological reserve all predispose elderly trauma patients to an increased risk for poor prognosis - including functional decline, diminished quality of life and mortality subsequent to injury**. (West ,. ١٩٨٢)**

Chapter١

Trauma epidemiology, types and classification

Definitions.

Traumas: can be defined as “a wound, especially one produced by sudden physical injury.”

An injury :is defined as "“unintentional or intentional damage to the body resulting from acute exposure to thermal, mechanical, electrical, or chemical energy or from the absence of such essentials as heat or oxygen.”***(National Safety Council, ٢٠٠٠)***

Epidemiology.

A World Health Organization (WHO) report in ٢٠٠٣ estimated that ٥.١٨ million people worldwide died from trauma in ٢٠٠٢ and approximately ٨٠,٠٠٠ in Europe. Injuries account for the ٩% of the total number of world's deaths and ranks fourth among all causes of mortality after cardiovascular diseases, infections and malignancies. ***(WHO, .٢٠٠٤)***

In the developed countries, the three greatest causes of violent death are road traffic accidents (RTAs)

falls and suicides. Generally, death rates from RTAs and falls are declining, while that from suicide is increasing. ***(Bourbeau, .١٩٩٣)***

The enlarging elderly population is more likely to have domestic accidents and to be more severely injured in any accident. Another influential factor affecting patterns of injury all over the world is the increasing use of alcohol and other drugs. In one study, about ٥٠% of people dying from injury tested positive for blood alcohol. ***(Dejevsky, .١٩٩٧)***

Types of trauma

١-ROAD TRAFFIC ACCIDENTS (RTA)

According to World Bank classification, Egypt is among the low/middle income countries of the Eastern Mediterranean Region. RTA is the ٧th leading cause of death, accounting for ٣.٢% of the total deaths, ٤.٣% of deaths in males in the region and ١.٩% of deaths in females. The most recent official reports from Egypt showed that in year ٢٠٠٠ there were estimated ٥,٨٣٤ deaths from RTA in all age groups. Males were more affected than females (٤,٧١٧ male versus ١,١١٧

female).The most affected age groups were from ١٥ – ٢٩ years (١,٢٤٠ deaths) and from ٣٠ – ٤٤ years (٩٢٦ deaths) ***(Mc Swain, et al,.٢٠٠٠).***

٢-INTENTIONAL INJURIES

Currently, numbers of suicides are increasing, and there are few countries where this is an exception. In many established market economies where the rate of road deaths is decreasing and the homicide rate is at least stable, suicides are forming a larger proportion of violent deaths. ***(WHO, .٢٠٠٤)***

٣-FALLS AND OTHER DOMESTIC DEATHS

The leading causes of deaths at home are falls, fires, suffocation, drowning and poisoning. Falls are the most common mechanism of injury in elders, accounting for ٤٠% of trauma in patients older than ٦٥ years, and they are the leading cause of injury-related death in this patient population. ***(Stevens, et al,.٢٠٠٦)***

In general, elder patients are more likely than younger patients to be injured as a result of activities of daily living. ***(Bergen, et al, .٢٠٠٧)***

٤-OCCUPATIONAL INJURIES

In the UK, the annual fatal injury incidence rate has been declining for many years. In ١٩٩٠ it came under ٢ per ١٠٠ ٠٠٠ employees, which is less than half the rate of the early ١٩٧٠s and less than one-quarter of the rate of the early ١٩٦٠s. A large proportion of this change is probably because of some demographic changes ***(Mazurek .١٩٩٤).*** However, it is also felt that there have been significant improvements in safety standards in many industries. (***Poyner and Hughes,.١٩٩٠)***

٥-NATURAL DISASTERS

The incidence of natural disasters is increasing, a fact which generally can be attributed to greater numbers of hydro meteorological disasters (such as tropical cyclones and flash floods) and bushfires. The incidence of geophysical hazards (earthquakes, volcanic eruptions) appears to be constant. (***Drever, .١٩٩٥)*** However, deaths caused by natural disaster appear to be rising disproportionately***. (Lees .١٩٩٦)***