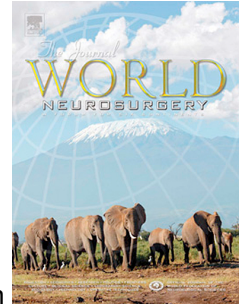


# Accepted Manuscript

The prognostic value of the Rotterdam scoring system to predict early death among patients with traumatic brain injury

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## INTRODUCTION

Traumatic Brain Injury (TBI) is among the leading causes of death in the United States (1). TBI is accountable for about 40% of all deaths induced by acute injuries in the United States and leads to about 52000 deaths each year. Motor vehicle accidents (50%) and falls (20–30%) are the most prevalent causes of TBI (2).

Early diagnosis of TBI is critically important to make sound clinical decision and to determine prognosis. One of the methods for such purposes is the Glasgow Coma Scale (GCS) which categorizes TBIs into mild, moderate and severe according to patients' level of consciousness. However, using GCS at the time of hospital admission is difficult and does not provide conclusive results because patients are intubated and/or receive narcotics. Moreover, GCS cannot differentiate among different types of intracranial injuries (3). Another diagnostic technique for assessing TBI is brain imaging by using Computed Tomography (CT) and Magnetic Resonance Imaging (MRI). Brain imaging significantly helps the early diagnosis and the effective treatment of life-threatening conditions in patients with TBI (4).

Brain CT is the gold standard for assessing patients with acute TBI. Given its ability to immediately show cranial and intracranial abnormalities, CT is considered as the modality of choice for evaluating patients with acute TBI. Moreover, it is used for determining severity of brain injuries. On the other hand, MRI is also widely used for brain imaging. Compared with CT, MRI has greater sensitivity for detecting contusions and diffuse axonal injuries (5). However, it is associated with several shortcomings such as the inability to show skull fractures, subarachnoid hemorrhages, and hyper-acute hemorrhages as well as the too long period of the imaging procedure. Consequently, MRI is mainly used for studying sub-acute and chronic TBIs (6).

Integrating clinical examination findings with CT findings has significantly improved the ability of determining the prognosis of TBI. However, performing clinical examinations on patients with TBI is difficult. Besides, the accuracy of clinical examination findings greatly depends on examiner's proficiency. Consequently, predictive models which are based solely on the findings of imaging studies,

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