INPLASY

Incidence and mortality related risk factors in patients with severe traumatic brain injury: A systematic review and meta-analysis

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INTRODUCTION

*R*eview question / Objective How should treatment strategies be organized to face patients with traumatic Brain Injury?
P – Treatment strategies; I – Adaptations in the organization of work processes; C – Not applicable; O – Facilitated access and morbidity and mortality reduction; T – patients with Traumatic Brain Injurys.

Condition being studied Over the years, it has garnered widespread attention due to its high disability and mortality rates. According to statistics from the United States between 1988 and 1998, the incidence rate of TBI was observed at 100 per 100,000 individuals annually, with an average of 52,000 fatalities per year, representing approximately 40% of acute trauma-related fatalities.

METHODS

Participant or population Study subjects comprise patients with severe TBI.

Intervention The onset and risk factors for mortality in severe TBI patients include age, anemia, diabetes, shock, hypotension, hypoxemia, trauma scores, and types of brain injury. Controlling these risk factors may help reduce the mortality rate among severe TBI patients.

Comparator No applicable.

Study designs to be included Database searches were performed across Web of Science, PubMed, CINAHL, and EMBASE, with search limits set from database inception to 2023-10-17. English search terms included "head trauma," "brain trauma," "mortality," "death," and "risk factor." Two researchers independently screened and extracted

data on the onset and risk factors for mortality of severe TBI patients. Statistical analysis was executed utilizing R 4.2.2.

Eligibility criteria Inclusion criteria: (1) Study subjects comprise patients with severe TBI; (2) Cohort studies; (3) Research content focuses on factors related to mortality in patients with severe TBI; (4) Relevant data is extractable.

Information sources Relevant data were assessed across PubMed, Web of Science, CINAHL, and EMBASE, with search limits set from database inception to 2024-7-10.

Main outcome(s) Incidence and mortality related risk factors in patients with severe traumatic brain injury.

Quality assessment / Risk of bias analysis The quality of cohort studies was evaluated using the Newcastle-Ottawa Scale (NOS). NOS assesses aspects such as selection of the study population, comparability between groups, and outcome measurement.

Strategy of data synthesis Statistical analysis was executed utilizing R 4.2.2. Concerning binary variables, the Odds Ratio (OR) was employed as the statistical effect size, whereas for continuous variables, the Mean Difference (MD) was utilized. Heterogeneity among the studies was assessed through the Q test and chi-square test. In case of I2 exceeding 50%, a random-effects model was used; alternatively, a fixed-effects model was employed. Subgroup analysis was carried out to evaluate different countries and different definitions of severe TBI. Furthermore, sensitivity analysis was performed using the leave-one-out method for mortality rates and employing different combined effect models for evaluating mortality-related risk factors. Additionally, assessment of the publication bias was executed through the Begg test and funnel plots. P< 0.05 was deemed statistically significant.

Subgroup analysis This study highlights various risk factors associated with the incidence and mortality of severe TBI patients, including age, anemia, diabetes, shock, hypotension, hypoxemia, trauma scoring, type of brain injury, and coagulation disorders. Based on different risk factors, different subgroups were divided into to analyse highlights various risk factors associated with the incidence and mortality of severe TBI patients.

Sensitivity analysis Sensitivity analysis was performed using the leave-one-out method for mortality rates and employing different combined effect models for evaluating mortality-related risk factors.

Country(ies) involved China/The First Affiliated Hospital of Kunming Medical University.

Keywords Incidence , mortality, traumatic brain injury, meta-analysis,physical disabilities.

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