

Clinical Profiles and Predictors of Traumatic Brain Injury Mortality: A Post Hoc Analysis

Zhou Tin Jik Chris(1), Lam Rossetti(1), Lee Che Young(1), Chung Karina(1), Ku Richard(1), Xie Brian(2), Yoshida Satoshi(2), Ng Zita(2)

1- Medical Student, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong SAR

2- Medical Student, The University of Hong Kong, Pok Fu Lam, Hong Kong Island, Hong Kong SAR

Introduction

Traumatic brain injury (TBI) can be life-threatening. Investigating its clinical profiles and mortality predictors is crucial for understanding the disease epidemiology, devising public health interventions, and improving patient outcomes.

Objective

To assess the correlation between age, sex, socioeconomic status, and the in-hospital mortality of TBI, and whether these factors are strong predictors of TBI patients' outcomes.

Method

This retrospective study analyzed head trauma patients treated in the Emergency Department. A total of 140,806 cases from 2000 to 2021 were included from the Clinical Data Analysis and Reporting System (CDARS) Database using the following International Classification of Diseases, Ninth Revision (ICD9) codes: 800-804, 850-854, 873.8(4), 900(0). Patients were stratified by age, sex, and neighborhood socioeconomic status (based on their residential districts' Social Deprivation Index [SDI]), and comparative analyses were performed using all-cause in-hospital mortality as the primary outcome measure.

Result

11,006 out of 140,806 TBI patients died from 2000 to 2021, yielding an all-cause mortality rate of 7.82%. Univariate analysis revealed that sex and age group were correlated with mortality rate differences. Male patients suffered higher mortality (8.15% vs 7.38%; Odd Ratio [OR]: 1.11, 95% Confidence Interval [CI]: 1.07-1.16, $P < 0.0001$), and so did elderly patients aged 70 years or above (14.8% vs 3.83%; OR: 4.37, 95% CI: 4.19 - 4.55, $P < 0.0001$).

However, the linear regression model of SDI vs mortality revealed no statistically significant correlation between neighborhood socioeconomic status and TBI mortality (R square = 0.006820; P = 0.3167).

Conclusion

Patients' sex and age group were independent predictors of in-hospital mortality of TBI, with the strongest correlation observed in male patients aged ≥ 70 . Higher neighborhood socioeconomic status, however, does not significantly protect against TBI mortality.

Keywords:

Traumatic brain injury, Head trauma, Injury epidemiology