Epidemiology of traumatic brain injuries based on hospital reports in mainland France

INTRODUCTION

Traumatic brain injuries (TBI) are defined as “an alteration in brain function or other evidence of brain pathology caused by an external force”. TBI represent an important public health problem in terms of frequency and severity (death and disability).

Recent epidemiological data on TBI in France are lacking. Thus, this analysis aims at gaining new insight into TBI epidemiology in France using data from the hospital nationwide database - the Medical Information System Program (PMSI).

METHODS

Annual analyses from 2011 to 2016 were performed on all the first hospital stays in mainland France registered in the PMSI database. The diagnosis of TBI was defined through the group of codes “S06: intracranial injury” of the International Classification of Diseases, 10th revision (ICD10), using the main, related, or associated diagnosis. The S06 group of codes are the only specific codes for TBI in the ICD10. Data collected for patients included: demographics, type of injury (concussion, edema, hemorrhage etc.), and vital status at the end of hospitalization.

Usually, brain injuries are categorized by severity levels into three groups: mild/moderate/severe. In this analysis, mild for one part, and moderate and severe TBI for another part, were distinguished.

Patients who died on the scene of the accident, data unavailable in the PMSI, are not included in this study, as well as patients who went to an emergency department without being hospitalized.

The statistical analysis was performed using SAS® Enterprise guide 7.1.

RESULTS

In 2016, 152,262 patients were hospitalized after the occurrence of a TBI in mainland France:

- Mostly men (55 % of patients)
- Median age of 63 years
- TBI are mainly mild TBI: 76%
- 3% of patients have severe multiple injuries
- 4% of patients were hospitalized in a neurosurgery ward
- 8% of patients were hospitalized in a resuscitation ward
- 6,689 patients died during their hospitalization. The lethality rate during the hospitalization was 4% (5% for men versus 4% for women)

INCIDENCE RATES OF HOSPITALIZED PATIENTS FOR TBI IN 2016

- The overall incidence rate of TBI is 229 per 100,000 (260 for men, 199 for women)
- The incidence rate of mild TBI is 175 per 100,000 (193 for men, 158 for women)
- The incidence rate of moderate/severe TBI is 54 per 100,000 (67 for men, 41 for women)
- Men are more often affected
- The epidemiology of mild TBI and moderate to severe TBI differs
- Mild TBI affects mainly young children (from birth through 4 years), young adults and the elderly
- Moderate to severe TBI most often affects young adults and the elderly

CONCLUSION

For the first time in France, this study provides results about TBI at a national scale. French incidence rates are in the range of incidence rates calculated in international studies based on hospital discharge. In France, as in other high-income countries, men, young children, young adults and elderly persons are more at risk of TBI. As in most of high income countries, incidence of TBI among the elderly is increasing. On one hand, with the decrease of morbidity from chronic disease, many elderly persons remain mobile and independent longer than in the past. They are consequently at risk of falls, which are the main cause of TBI in this group. On the other hand, the increase of anticoagulant and platelet aggregation inhibitors consumption in elderly persons could explain this phenomenon. These medications are associated with a high risk of TBI in case of falls.

These results contribute to improve TBI epidemiological monitoring in France. Other sources of data, like emergency data, will be necessary to measure more accurately the number of victims of mild TBI. Furthermore, research aiming at improving knowledge about causes, mechanisms and factors associated with TBI is needed in order to expand effective TBI prevention measures.

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