Causes of In-hospital Traffic Accident Mortality

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ABSTRACT: Annually, 1.2 million people lose their lives due to traffic accidents worldwide. Prevention from avoidable mortalities is one of the most important health care objectives in many countries. Iran is a developing country with the high rate of traffic accident mortality (TAM). The aim of the present study was to investigate the causes of in-hospital TAM, in order to find possible solutions for alleviating the problem. Totally, 127 cases of trauma-induced mortality due to traffic accidents in the patients admitted to Imam Hossein Hospital from 2011 to 2013 were analyzed retrospectively regarding demographic data, mechanism of trauma and causes of mortality based on autopsy, and using SPSS 18 statistical software program. Among 53,322 trauma patients admitted during the study period, 127 cases (0.2%) died, 81% of whom were male. The mean and SD of the age of the patients was 25.7±7.2 years. The most common trauma mechanisms and causes of mortality were motorcycle accident and hemorrhagic brain injuries, respectively. Most accidents occurred from 8pm to 12pm and most cases of mortality occurred during less than 24 hours from accident. Since traumatic head injury is the most common cause of in-hospital TAM, it seems that focusing on preventive measures such as using safety belts and equipping the hospitals with necessary facilities can be effective in mitigating this problem.

Key words: Traffic Accident Mortality, Cause Of Death, Trauma Induced Mortality.

INTRODUCTION

Trauma means a physical injury caused by a sudden or short-term exposure of human being with varying degrees of energy (ACSCT, 1997). As defined by the World Health Organization, trauma occurs in the case of acute exposure to mechanical energy, heat, electricity, chemicals and ionizing radiation, at the levels above the tolerable levels for humans (Sur, 2010). Meanwhile, mechanical energy accounts for three quarters of all types of trauma (Elechi and Etawo, 1990). Trauma is one of the most important causes of death in the first four decades of human life, as 1.2 million people lose their lives due to traffic-related accidents across the world every year (Feliciano et al., 2008; FSEN, 2003). More than half of trauma-induced deaths occur within the first few minutes after the accident and because of hemorrhagic brain injuries (Forensic statistics. Noruz newspaper 2002). The rate of traffic accident mortality has increased in recent years in Iran, and has experienced 15 percent annual growth during 1994-2001 (Heron and Tejada-Vera, 2009). Since prevention from avoidable mortalities is one of the most important health care objectives in many countries, this study aimed to investigate the causes of deaths due to traffic accidents, in order for finding possible solutions and planning to alleviate this problem.

METHODS

All cases of trauma induced mortality due to traffic accidents in the patients admitted to Imam Hossein Hospital from 2011 to 2013 were analyzed retrospectively regarding demographic data, mechanism of trauma and causes of mortality. Demographic data and mechanisms of trauma were obtained from hospital records and causes of mortality were obtained from autopsy results provided by Kahrizak Forensics Center. Finally, the collected data were statistically analyzed using SPSS 18 software program to answer the research questions. For the sake of ethical considerations, the identifying information, such as personal data, case number, and other determining information of the patients were not included.
RESULTS

Among 53,322 trauma patients admitted to Imam Hossein Hospital during the study period, 127 cases (0.2%) died, 81% of whom were male and 26% of the patients (n = 33) lost their lives at accident scene. The mean and SD of the age of the patients was 25.7±7.2 years (three cases aged less than 10 years and seven cases aged above 60 years); 40% of the subjects (n = 51) were admitted from 8pm to 12pm. Figure 1 shows the position of the victims during trauma. Most cases of mortality occurred in motorcyclists and pedestrians (66.9%); while 64.5% of the patients (n = 82) had evidences of head injuries on arrival at the emergency department. Figure 2 shows the duration time from accident to death, where 65.3% of mortalities occurred in less than 24 hours from the time of the accident and more than half of them occurred in the emergency department. Figure 3 shows the final causes of mortality based on autopsy results. As it can be seen, the most common causes of death were head injuries and thoracic trauma. Traumatic brain injuries (TBI) included epidural hematoma (33%), subdural hematoma (28%), subarachnoid hemorrhage (22%) and intracranial hemorrhage (11%), respectively. Lobar pulmonary laceration and associated arteries was the most common cause of death due to chest trauma as indicated in the autopsy reports. Regarding abdominal and pelvic traumas, liver laceration, large hepatic hematoma, associated arteries laceration, and pelvic and acetabular fractures were the most frequent causes of mortality due to trauma to abdomen and pelvis.
DISCUSSION

The results of this study indicate that most cases of mortality due to traffic accidents occurred during the first 24 hours after the accident (in the early hours after trauma), and due to head injuries and chest trauma. Mortalities in the days after accident mainly occurred due to the complications of the trauma, i.e., pulmonary contusion and infections in ICU, but not the trauma mechanism itself. As expected, most of the involved people were young and active men, as 84.2% of them aged less than 50 years. Traffic accident mortality rate has been reported to be 270 per one million people in Iran. While this level has been reported as low as 20-30 cases in the developed countries (Khorram, 2003). In a study conducted using benchmarking methodology at two academic centers of Tehran, mortality rate of the accident casualties after standardization of the intensity of the accidents were higher than those cases in trauma centers in the United States (Owen, 2004). Traffic accident mortality rate in the year 2000 was more than 17,000 cases, in the year 2001 it was nearly 20,000 cases and in the year 2002, it was more than 22,000 cases (Raj et al., 2002; Sausia et al., 1995). The majority of fatal and non-fatal traumas in the United States also occur in youngsters, and those aged less than 45 years experience 61% of all deaths due to trauma (65% of whom are male). The rate of trauma-induced mortality in people aged 65 years and above is 103 per 100,000 (Trunkey, 1983). In our study, the mortality rate for people aged over 60 years was 7 cases in 53,322 trauma patients, which are nearly 13 cases per 100,000 people. Two studies in 1998 and 2002 determined traumatic brain injury as the most common cause of death (Varastekia, 2002), the findings of this study are also correlated with those of the two studies. In other words, the vast majority of cases of traffic-accident mortality may be prevented in the case of introducing more stringent rules for using helmets, seat belts and air bags. A study by Souri, et al. found that that mandatory seat belt legislation in Iran has reduced the severity of the injuries and subsequent mortality rate (World Health Organization, 2001). In addition, if the emergency departments of the involved hospitals can be equipped with diagnostic tools for such injuries and if they can employ more surgeons and neurosurgeons, a great contribution will be made to the early diagnosis and improved prognosis of these patients. In summary, it can be concluded that the reduction of rate of traffic accident mortality requires a series of continuous cooperation between the police, the public and the medical team. Here, preventive measures can be implemented primarily, and then in the case of accident, with timely response and mobilization of facilities and equipment a major step can be taken in alleviating such a great problem faced by the valued active segment of population of the society.

CONCLUSIONS

Given that traumatic head injury is the most common cause of traffic accident mortality, it seems that focusing on preventive measures such as using safety belts and equipping the hospitals with necessary facilities can be effective in mitigating this problem.

REFERENCES
