Mini Review Article

Traumatic Brain injury in relation to hemotion trial: Review

Arisha Fatima*,

INTRODUCTION

Traumatic brain injury usually occurs as a result of a strong fall or hit to the head or body. An object which cause the brain injury are such as a bullet or a hard tool, also it can cause severe brain injury. A mild brain injury can have a temporary effect on the brain cells. A more serious head injury that can lead to bruising, tissue rupture, hemorrhage, and damage to the brain. These injuries can lead to long-term complications or death.

SYMPTOMS

A brain injury can have many physical and psychological consequences. Some of the signs or symptoms may appear immediately after the traumatic event, while others may appear within a few days, or even weeks. Physical symptoms include headache, nausea (feeling sick), vomiting, fatigue and loss of balance. Sensory problems, such as blurred vision, ringing in the ears, bad taste in the mouth, or a change in the ability to make sense of smell. Symptoms in children include changes in eating habits, a slight irritability, increased crying, seizures, lethargy, and depression.

CAUSES

Traumatic brain injury usually occurs as a result of a hit of hard thing leading to traumatic injury to the head or body. The extent of the damage depends on a number of factors, including the nature of the injury and the force of the impact. Common causes include falls, vehicle crashes, domestic violence, sports injuries, explosives, explosions, and other combat injuries.

COMPLICATIONS

Moderate-to-severe traumatic brain injury can lead to long-term or permanent changes in one's state of consciousness, or awareness, or sensitivity. The different states of consciousness include coma, vegetative state, minimally conscious state of the brain and cause death or serious attacks.

TRAUMATIC BRAIN SURGERY

After the primary injury, the management of patients with traumatic brain injury (TBI) in the pre hospital setting, emergency department, ICU, or operating room focuses on the avoidance of secondary brain insults from systemic derangements such as hypotension, hypoxemia, and anemia. Impaired oxygen (O2) delivery to the brain is thought to be an important factor in the development of these secondary brain injuries, and therefore anemia in the acute admission period may decrease oxygen delivery at a time when the traumatized brain is acutely vulnerable to these secondary insults.

The classic approach in the field of neurosurgery has been to transfuse red blood cells (RBCs) in patients with TBI to maintain a hemoglobin (Hb) level greater than 10 g/dl or hematocrit greater than 30% for the theoretical principle of maintaining optimal oxygen carrying capacity. However, more recently clinical practice has moved towards a restrictive transfusion strategy (maintaining Hb concentrations ≥7 g/dl) after studies showed liberal transfusion strategies (Hb ≥10 g/dl) may be unnecessary, or perhaps even harmful in the general critical care setting. Although there is ongoing concern that the high metabolic requirements of the injured brain may render it more susceptible to injury at a lower transfusion trigger, few studies have focused on this important subgroup of critically ill patients, and most have been underpowered to identify a minimally acceptable Hb thresholds. Because of this conflicting evidence, there is an ongoing debate regarding the optimal transfusion threshold in patients with TBI.

The present review will summarize the recent studies looking at the physiological effects of anemia and RBC transfusions (RBCT) in critically-ill patients with TBI, discuss the transfusion practice variations observed worldwide, and review the current evidence and guidelines for transfusion strategies in patients with TBI.

PREVENTION

Follow these tips to save your brain by putting it to risk:

- Seat belts and air bags. Always wear a seat belt while driving. A small child should ever have to sit on the back seat of a car, or stored in a child safety seat or a booster may not be suitable for its size and weight.
- The consumption of Alcohol and illicit drug use. Do not drive under the influence of alcohol or drugs, including prescription drugs, which can have an impact on your ability to drive.
- Wear a helmet when riding a bike, skateboard, bicycle, and scooter. You will also need to wear head protection while playing baseball, or contact sports, downhill skiing, ice skating, snowboarding, or riding a horse.
- Pay close attention to your surroundings. Do not drive, walk, or cross the street along with your smartphone, tablet, or other mobile device. These distractions may cause an accident or malfunction.

DEGENERATIVE BRAIN DISEASES

As the link between neurodegenerative diseases of the brain and the brain is still unclear. However, some studies show that repeated and / or severe traumatic brain injury may increase the risk of developing degenerative brain diseases. However, this risk could not be attributed to any specific individual person, and scientists are still in search of what, why, and how traumatic brain injury can be associated with degenerative brain diseases.

A degenerative disease of the brain and may lead to a gradual loss of brain functions, including but not limited to:

- Alzheimer's disease, which mostly leads to a progressive loss of memory and other thinking skills.
- Parkinson's disease which is a progressive disorder that causes movement problems, such as tremors, stiffness and slowness of movement.
- The fight against dementia-most commonly associated with repeated blows to the head in a boxing career, which causes the symptoms of dementia and movement problems.

Department of Pharmacy, United Institute of Pharmacy, Uttar Pradesh, India

Correspondence to: *Arisha Fatima, Department of Pharmacy, United Institute of Pharmacy, Uttar Pradesh, India, E-mail: Khanaeram8@gmail.com*

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EFFECT OF TRANSFUSION

The association between anemia and poor outcomes in patients with TBI is an inconsistent finding. Understanding that anemia is considered a marker of 'illness-severity' in critically ill patients and included as a variable in ICU risk prediction models, it is understandable that several observational studies have shown an association between anemia and poor outcomes in patients with TBI. However, other studies evaluating anemia and TBI outcomes have not demonstrated a consistent risk of harm. The methodological limitations restricting comparisons between these observational studies include: the inconsistent definitions of anemia and TBI severity; variable timing of Hb measurements; lack of consideration of Hb exposure during the acute admission period; different outcome measures; and residual confounding from factors that are associated with both anemia and outcome. Several studies have explored Hb exposure over time rather than admission values only, incorporating methods including repeated Hb concentrations, mean Hb concentration during the first 7 days, and time-weighted or area under the curve (AUC) exposure. A recent study observed that both the percentage of time that the Hb at least 9 g/l and AUC was associated with favorable 6-month neurological outcomes based on the Glasgow outcome scale (GOSe), independent of RBCT administration.

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