Sample term paper on pediatric traumatic brain injury

Sociology, Violence

\n[toc title="Table of Contents"]\n

\n \t

1. Introduction \n \t
2. Characteristics \n \t
3. Developmental Course \n \t
4. Treatment Options \n \t
5. Controversies \n \t
6. Conclusion \n \t
7. References \n

\n[/toc]\n \n

Introduction

Pediatric traumatic brain injury (TBI) is one of the leading causes of disability and death in children and adolescents in the world today. It is a condition that involves head injuries that are attributed in pediatric deaths and disability across the world. This condition physically affects the pediatric population in different ways than adults. It all depends with the differences in body size and proportion. It brings about anatomic and physiologic differences in children such as greater head to body ratio, thinner cranial bones which offer less protection to the brain, increased vulnerability of brain cells due to less maturity, malignant edema which is more common due to the increased intracranial pressure that is more frequent (Andrews, 2013). Similarly, it brings about diffuse cerebral swelling that is much more common due to mass lesion. Pediatric traumatic brain injury is a major public health problem among children and adolescents that causes about 62, 000

children to sustain brain injuries that require hospitalization due to accidents that occur from vehicles or falls brought about by sports injuries or physical abuse (Tecklin, 2008). It is a condition that brings about morbidity and mortality as well as epilepsy.

Pediatric traumatic brain injury has become extremely common these days. It usually results from head injuries, especially a severe knock on the head. When the brain is injured the functions of the nerve tracts and the neurons or even other sections of the brain get affected. It makes the brain unable to carry messages that inform the brain on what to do. This eventually affects the way people think, act, feel and move their body. It can also change the complex internal functions of the body where the regulation of body temperatures, blood pressure and bowel and bladder control are affected. The injury to the brain can range and depend on various factors such as the type, location and severity of the injury (Tecklin, 2008).

Characteristics

The characteristics of pediatric traumatic brain injury involve the physical, cognitive and social aspects. The cognitive effects include those injuries that affect the way people think, learn and remember things, and this is usually the common characteristics of this disorder. The brain contains different mental abilities that are located in various parts. Any injury to the brain will bring about huge damages on the way people remember things and their thinking capacity is affected significantly. This brings about the issue of children and adolescents being perceived to be mentally challenged, while in the real sense they are just suffering from the consequences of brain injury.

The speed of thought, memory, understanding, concentration, solving problems and use of language are some of the effects experienced by children who suffer from pediatric traumatic brain injury. It affects the way they reason and respond to particular situations where they find it hard to remember, think or understand simple concepts (Kirkwood, 2012).

This disorder also bears challenges in that it brings about communication problems after the brain has been injured. The ability to communicate requires very complex skills and many different parts of the brain are involved. Therefore, it is very common for people suffering from this condition to have communication challenges, especially when the disorder becomes severe. Traumatic brain injury offers threats to cognitive health through the effects of the brain that affect the way people think, learn and remember. It brings about different mental abilities that are located in various parts of the brain. Any injury that occurs in the brain is likely to damage some of the skills that are involved in carrying out activities in the human body. They affect the skills of such activities as the speed of thought, memory, understanding, concentration as well as solving problems and the use of language. These challenges are accompanied by the problems in communication. These affect the brain and make it impossible to make any communications effectively. It is important to note that the ability to communicate requires very complex skills and involves many different parts of the brain (LI, Linda, 2013).

Developmental Course

Additionally, traumatic injury in the brain brings about other challenges such as dysfunction after the brain has been injured. This affects the cognitive, emotional and behavioral difficulties which come about after the brain has been injured at the front lobe of the brain. This is coupled with hormonal imbalances and pituitary dysfunction. The hypothalamus part of the brain and the pituitary gland are involved in the release of hormones and if the brain is injured the important part of the brain will be affected thus bringing about a reduced or more release of any of the hormones (Sherman, 2012). The physical effects of the brain include sudden changes in behavior and reaction to certain situations. It also brings about post-traumatic amnesia. Pediatric traumatic brain injury commonly referred to as (TBI) involves some facts such as head injuries that include cuts, bumps, bruises or even fall. These can lead to concussions, skull fractures and serious brain injuries. They are common in children and adolescents across all ages. Research has shown that more brain injuries occur during spring and summer months especially on weekends where children are more vulnerable to outdoor activities. The Brain Injury Association of America indicates that traumatic brain injury has been the leading cause of death and disability in children and adolescents across the world. They indicate that the age groups that are more prone to brain injury include infants and children between the age of 4 years and teenagers from 15 to 19 years. Their resources also indicate that annually there are about 564, 000 children who are treated for brain injuries in the emergency room. This is followed by about 62, 000 children who get hospitalized every year (Chung-Ching, 2010).

Hospitals and medical facilities facilitate treatment processes depending on the specifics and severity of the particular injury. For instance, in Boston hospitals are better equipped with the required resources that enable them to treat children with brain injuries. Over 600, 000 children in the United States are seen in the emergency departments for head trauma (Chung-Ching, 2010). Approximately half of them go through CT scans that help evaluate the level of damage caused in the brain. In the assessment of the injuries caused to the brain, the basic symptoms are analyzed and evaluated. These include: unconsciousness, inability to remember the cause of the injury or events that occurred immediately before or up to 24 hours after, confusion and disorientation, trouble in remembering new information, headaches, dizziness, blurred vision, nausea and vomiting. This is accompanied by certain rings in the ears, trouble speaking coherently and changes in emotions or sleep patterns (Chung-Ching, 2010).

Evaluations on the severity of the symptoms depend on whether the injury was mild, moderate or severe. A mild traumatic brain injury brings about concussions where other symptoms occur at the time of the injury or soon after. They are usually temporary and can vanish after a few hours, days or weeks. Moderate traumatic brain injury causes unconsciousness that lasts for more than 30 minutes (Blosser, 2003). Severe traumatic brain injury last longer where the symptoms are more serious. The assessment and identification of this disorder include evaluating the diagnosis. This includes carrying out primary and secondary survey on the disorder. First of all, the primary survey focuses on the physical examination that aims at identifying and treating the conditions that offer threats to life in the trauma patient.

This helps in preventing secondary brain injuries that include evaluation of the airway. This involves determining whether there is the presence of foreign bodies, facial lacerations, bone instability, tracheal deviation and breathing problems such as hyperventilation. This also involves the determination of the circulatory system where conditions such as hypertension are evaluated. In addition to this, the neurologic status involves the verbal, pain, unresponsive system (Blosser, 2003).

The secondary survey of patients who suffer from head trauma includes a detailed examination and assessment of individual systems. This is done in order to identify all traumatic injuries and directing further treatment. This whole process includes evaluation of aspects or rather organs such as the head, the respiratory patterns and the neurologic status. The head is assessed through the cervical deformity, malignant, lacerations, and depressions just to mention a few. Similarly assessment requires testing where laboratory tests are conducted to determine children with head trauma (Apps, 2012). These tests include: serial complete blood counts, blood chemistries for instance amylase and lipase levels, it also includes coagulation profile that involves promothrombin time, internalization normalized ratio and activated partial thromboplastin time. Similarly, it also requires typing and crossmatch, arterial blood gas and blood or urine toxicology screening. The testing process also involves imaging studies that require radiologic analysis that are used in evaluating pediatric head injuries. This involves CT scans of the head that helps in analyzing the level of damage. Similarly, there is the magnetic resonance imaging of the brain that requires intracranial evaluation of traumatic brain injuries (Blosser, 2003).

The procedures involved during the testing process include monitoring the intracranial pressure that is indicated in patients with severe levels of traumatic brain injuries and abnormal CT scans. It may also be prevalent in patients who are unconscious with CT findings that suggest the risks of neurologic deterioration. It can also be done on patients who have the inability to perform serial neurologic exams due to pharmacological anesthesia (Apps, 2012).

Pediatric traumatic brain injury is a condition that should be treated as early as possible before it causes more damage to the children during their development stages. The treatment of children with severe head injuries requires management of issues such as: the airway, cardiovascular and circulatory status, intracranial pressure and cerebral perfusion, breeding and seizures. This should be accompanied by the management of body temperatures and analgesia, sedation and neuromuscular blockade. Surgery may also be applied to treat surgical decompression, elevation and decompressive craniotomy (Apps, 2012).

Treatment Options

Treatment is observed through various options where medical, technological, educational and therapeutic strategies are utilized. Medically, pediatric traumatic brain injury is treated through maintaining of body temperatures. It also requires removal of cerebro-spinal fluid through external ventricular drains or lumbar drains that are necessary in patients with increased intracranial pressure (Anderson, 2010). Technologically, the disorder may be treated through the use of CT scans or screening processes that require the

assessment of the head and the brain through machines that help in identifying where the problem is. It also involves magnetic resonance that helps in imaging the brain. This process is more sensitive than CT scanning for intracranial evaluation of traumatic injuries. Another technological aspect used is the ultrasonography that is applied for small infants with open fontanels. It helps in treating the skull fractures (Anderson, 2010).

The therapeutic treatment process requires pharmacology in patients with head trauma. It is directed at controlling intracranial pressure through the administration of sedatives and neuromuscular blockers diuretics and anti-Convulsants. It requires non-depolarizing neuromuscular, diuretics just to mention but a few. This is followed by the educational mode of treatment where parents are advised and taught on how to take care of their children. They are advised to prevent them from encountering incidents that bring about accidents to their lives (Anderson, 2010). This is followed with clear measures that hinder parents and children as well from engaging in activities that are safe for them. It also helps patients suffering from this disorder to recognize and treat life threatening conditions and to eliminate or minimize the role of secondary injuries. This should be accompanied by frequent consultation with neurosurgeons. In cases where child abuse is suspected, the system requires that a child advocacy is notified in order to offer protective services.

The pediatric traumatic brain injury (TBI) has severe symptoms that affect people in different ways. The symptoms may be recognized early enough while in some instances they may be hidden to evolve later in life as the child develops. The effects of mild traumatic brain injury include feeling tired

at all times, feeling sad and anxious, frustrations and feeling overwhelmed easily, doing things without having second thoughts, irritation and anger all the time and trouble concentrating, remembering and focusing on tasks (Andrews, 2013). People with traumatic brain injury often feel like harming themselves, and therefore, require effective treatment and proper counseling in order to manage their emotions. The disorder can be managed through getting enough sleep, establish daily and regular routines, ensuring that there is a person who can be trusted when making decisions, writing down things that need to be accomplished as well as avoiding things that could lead to increased blood pressure such as alcohol and cigarettes. Patients who encounter these conditions should be well taken care of in order to prevent damage and secondary injuries (Andrews, 2013).

Controversies

Pediatric traumatic brain injury faces various controversies through the treatment and diagnosis processes. This controversy is evidenced through mild traumatic brain injury (MTBI) that is also referred to as a concussion. The controversy comes out because the brain often appears quite normal on conventional computed tomography (CT) and magnetic resonance imaging scans (MRI). These tools do not bring out brain injury in mild traumatic brain injury as they are not sensitive to detecting diffuse axonal injuries (DAI) also referred to as traumatic axonal injuries (TAI). This shows the controversy between the magnetic resonance imaging and diffusion tensor findings in mild traumatic brain injury. Approximately 15-30% of the patients diagnosed with a mild traumatic brain injury on the basis of cognitive and clinical

symptoms (Tecklin, 2008). This means that the cognitive and physical symptoms do not resolve in the first 3 months after the injury. These conditions persist and in some cases bring about long term disability. The controversy in other stages advances and may lead to the development of biomarkers of injury as well as the staging of reorganization and reversal of white matter changes that occur due to the injury. They also bring about the ability to track and characterize changes in brain injury over time (Tecklin, 2008).

Conclusion

Pediatric traumatic brain injury is a condition that requires much attention in that it deals with the most sensitive parts that make up the human psychology. The human brain is a very delicate part of all the other parts of the body, and any knock on the head is likely to cause severe damage on the same. Pediatric traumatic brain injury should be diagnosed as early as possible by utilizing the right tools in prevention and treatment. The treatment procedures require proper evaluation of the causes as well as the level of severity. Different methods are utilized, whereby each helps in analyzing whether the patients have had any other injuries. Whereas in certain cases symptoms are easily detectable, others it is difficult to be detected because they are hidden, and this makes the diagnosis and treatment even harder.

References

Anderson, V., & Yeates, K. O. (2010). Pediatric traumatic brain injury: New frontiers in clinical and translational research. Cambridge: Cambridge

University Press.

Andrews PJ; Sinclair LH; Harris B; Baldwin MJ; Battison CG; Rhodes JK; Murray G; De Backer D; (2013). Study of therapeutic hypothermia (32 to 35°C) for intracranial pressure reduction after traumatic brain injury (the Eurotherm3235Trial): outcome of the pilot phase of the trial. Eurotherm3235Trial collaborators, Trials [Trial], 14 (1), 227.

Apps, J. N., & Walter, K. D. (2012). Pediatric and adolescent concussion: Diagnosis, management, and outcomes. New York, NY: Springer.

Blosser, J., & DePompei, R. (2003). Pediatric traumatic brain injury: Proactive intervention. Australia: Delmar/Thomson Learning.

Chung-Ching Chio; Jia-Wei Lin; Ming-Wen Chang; Che-Chuan Wang; Jinn-Rung Kuo; Chung-Shin Yang; Ching-Ping Chang. (2010). Therapeutic evaluation of etanercept in a model of traumatic brain injury C.-C. Chio et al. Etanercept in a traumatic brain injury. Journal of Neurochemistry, 115 (4), 921-929.

The Effects of Pediatric Traumatic Brain Injury on Verbal and Visual-Spatial Working Memory. (2012). Journal of the International Neuropsychological Society, 18 (1), 29-38.

Kirkwood, M. W., & Yeates, K. O. (2012). Mild traumatic brain injury in children and adolescents: From basic science to clinical management. New York: Guilford Press.

LI, LINDA; LIU, JIANGHONG. (2013). The effect of pediatric traumatic brain injury on behavioral outcomes: a systematic review. Developmental Medicine & Child Neurology, 55 (1), 37-45.

Sherman, E. M., & Brooks, B. L. (2012). Pediatric forensic Neuropsychology. Oxford [etc.: Oxford University Press.

Tecklin, J. S. (2008). Pediatric physical therapy. Philadelphia: Lippincott Williams & Wilkins.