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Memory, Attention, and Language Disorders in Craniocerebral Injury

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Abstract

Background: A Traumatic Brain Injury (TBI) can cause temporary dysfunction of brain cells. More severe craniocerebral injuries can lead to bruising, perforation and tissue rupture, bleeding, and other physical damage to the brain that can lead to long-term complications or death. Consequences of TBI can include physical, sensory, behavioral, and communication disorders, as well as disturbances in cognitive functioning.

Aim: To investigate cognitive consequences after Traumatic Brain Injury (TBI)

Conclusion: Cognitive deficits (impairments in thinking skills) may include changes in perception of his environment, distraction, lack of rational thinking, inability to solve problems, and executive functionality. Although re-learning ability is affected by memory deficits, long-term memory impairment for events and things that happened before the injury, however, the general state of memory may remain unaffected.

Keywords: Cognitive functioning; Traumatic brain injury

Introduction

A craniocerebral injury can have a wide range of physical and psychological consequences. Some signs or symptoms may appear immediately after the traumatic event, while others may appear days or weeks later. In terms of their extent, brain damage can range from mild to severe [1]. Traumatic brain damage results in permanent neurobiological damage that can lead to varying degrees of deficient abilities many times over a lifetime. Moderate to severe brain damage is usually characterized by injuries that have the following characteristics:

- Moderate TBI is defined as a brain injury that results in loss of consciousness from 20 minutes to 6 hours and a score on the Glasgow Scale from 9 to 12.
- Severe TBI is defined as a brain injury resulting in loss of consciousness for more than 6 hours and scores on the Glasgow Scale from 3 to 8.

The impact of a moderate to severe brain injury depends on the severity of the initial injury, the rate and completeness of the recovery of normal reactions, the functions affected, the extent of the dysfunction caused to the patient, the resources available for the individual to fully recover and its functions that remain unaffected despite the TBI [2].

Consequences After TBI

Consequences of TBI can include physical, sensory, cognitive, behavioral, and communication disorders, as well as disturbances in functional processes such as swallowing. These problems significantly limit the sufferer's ability to live independently. Problems vary depending on how diffuse the brain damage is and what the location of the injury is. Behavioral changes include changes in the perception, expression of emotions, agitation and/or militancy, anxiety or anxiety disorders, and depression [3]. A person with TBI may also experience intense and abrupt mood swings, impulsivity, irritability, and decreased frustration tolerance. Cognitive deficits may include changes in perception of his environment, distraction, lack of rational thinking, inability to solve problems, and executive functionality. Although re-learning ability is affected by memory deficits, long-term memory impairment for events and things that happened before the injury, however, the general state of memory may remain unaffected [4].

The person may have difficulty starting their tasks and setting goals to complete them. Difficulties can also be observed in the planning and organization of a project and in the self-evaluation of the project. The sufferer often seems disorganized and needs help to perform even simple tasks. Problem solving and situation management are also greatly affected, sufferers often experience an inability to solve rational problems and quite often show spontaneous reactions to stressful situations. Communication deficits are often characterized by difficulty understanding or producing correct speech, unstructured speech resulting in weak muscles and/or difficulty controlling the mouth muscles to produce speech. In people with TBI, understanding written and spoken language quite often proves to be quite difficult [5]. They may also have difficulty spelling, writing and reading. Some people may have difficulty communicating socially, such as having difficulty rotating in conversation and having problems maintaining a topic during conversation. More frustrating for their families and friends, people with TBI may have little or no awareness of how inappropriate their behaviors.

Sensory Disorders

Aesthetic deficits can include all the aesthetic details, depending on the areas of the brain involved. A TBI can lead to the well-being of the individual, either more or less sensitivity or change/loss of consciousness, or even cause the sufferer to be unable to synthesize his senses causing him geographical and temporal disorientation [6].

Changes in the senses may include the following:

- Brain injury can cause changes in the way a person feels or reacts to pain.
- It can also lead to changes in a person's ability to feel temperature or touch.
- Impossibility of feeling the parts of their body in relation to the surrounding area or even in extreme cases in relation to the rest of their body resulting in be more vulnerable to injury. For example, the person may not be able to feel their hand on sharp objects.
- Brain injury can cause changes in vision. These may include: Hemianopsia or visual neglect, where visual information received from one visual input of the body is not processed by the brain.

Cognitive Consequences

Perceptual disorders are diseases that affect the human senses, such as smell, sight, taste, hearing, touch, and can be devastating to a person because people rely heavily on the senses to function in their daily lives [7]. Perception disorder can be encountered in the following 3 ways:

- Sensory distortions, ie the distorted perception of objects
- Sensory deception, ie the perception of objects or events that are usually not in line with external stimuli
- Disorders in the sense of time when the patient misunderstands the time or the time period. Disorders can also be observed in the intensity of aesthetic perceptions. The person may experience hallucinations or an increase in the senses or a decrease in the normal sensory threshold. Some examples are hypereaction, hypoea, change in the shape of an object, microscopy and macropsy and more. The patient may also experience symptoms of hallucinations and obsessions.

Memory Disorder

Memory disorders are the result of damage to the neuroanatomical structures that prevent the storage, preservation and retrieval of memories. Some examples of memory disorders include: Ignorance is the inability to recognize certain objects, faces or sounds, but there are many more specific diagnoses of ignorance depending on the characteristics of the symptoms. Ignorance is usually caused by damage to the brain or a neurological disorder [8]. Treatments vary depending on the location and cause of the lesion. Recovery is possible, depending on the severity of the disorder and the severity of the brain damage. Some examples of specific types of ignorance include: Associative visual ignorance, auditory ignorance, acoustic verbal ignorance, person cognition, visual ignorance etc. Amnesia is an abnormal mental state in which memory and learning are disproportionately affected by other cognitive functions in a patient with full alertness and response. Progressive amnesia and retrograde amnesia, associated with hippocampal or temporal lobe lesions. Patients with progressive amnesia have difficulty learning and retaining information that emerged after brain damage. Patients with retrograde amnesia retain some memories generally have memories of personal experiences or memories that belong to a general framework of independent semantic information [9].

Attention Disorders

Attention disorders concern: Rapid exhaustion: typically seen in people with TBI and fractures of the white or gray matter of the frontal lobes. Prone to distraction observed in patients with parietal or frontal lesions or in patients in a state of confusion. Attention deficit disorder is a neurobiological-based developmental disorder characterized by 3 predominant symptoms: short attention span, intense mobility, and impulsivity. The difference between patients and people who may have the same symptoms is that people with attention deficit disorder present the above behaviors at a level inconsistent with their developmental level, age and frequency or power that is a significant burden in key areas of their daily lives and interpersonal relationships. In a patient with attention deficit disorder, mental retardation and speech and joint disorders are observed. The general clinical observation of the immediate repetition of a series of words, a sequence of numbers and the inability to concentrate the gaze at a fixed point even in a familiar place are some of the symptoms/ indications for further clinical examination [10].

Language Disorder

When a person is unable to produce speech sounds properly or fluently, or has problems with his voice, then he suffers from a speech disorder. Difficulty pronouncing sounds or joint disorders, and stuttering are examples of speech disorders. Also when a person has trouble understanding others, or sharing thoughts, ideas and feelings, then he or she has a language disorder. A stroke or brain injury is the most common cause of these disorders in adults, while in children the genetic factor plays a fairly large role. Language disorders are often characterized by difficulty in understanding or producing speech, slurred speech as a consequence of weak muscles, and/or difficulty in programming the mouth muscles to produce speech. In people with TBI understanding spoken and written language can be a difficult achievement and usually resembles the effort you make when a healthy person is trying to understand a foreign language.

Discussion and Conclusion

In summary, people suffering from craniocerebral injury may present disturbances at any level of the cognitive function process. Any Short-term memory impairment during the initial stage of recovery occurs rarely and especially in cases with serious injuries. During post-traumatic amnesia, the cause of

long-term memory impairment and the assessment of other cognitive functions remain unclear. Damage to semantic memory is possible although they are rarely completely lost information obtained. Regarding the expected memory, it rarely records lesions in cases of craniocerebral injury, but without being an element of great importance for the patient to reintegrate into his obligations and social total. Possible memory impairments appear to affect the functioning of the language. The patients with impaired memory have difficulty finding the right word, in spelling and reading as well as the sequence of a large number of commands. All these result in the fragmentation of the language, which lacks in accuracy, sequence, specificity and logic.

Another memory-related disorder is disorientation due to inability of the patient to recall older and newer information. The presence confusion due to disorientation after TBI makes his cooperation difficult patient with specialist. Disorientation occurs at four levels: in time, in space, in the individual situation and in the individual himself. Of the above categories of disorientation, the most common is that of time. Patients experience confusion related to year, month and even hour which they go through. They also have difficulty estimating how time passes. The patients with this confusion have been injured in the right hemisphere. People with spatial disorientation do not recognize the place they are located or misidentified. The next category is the one that's disorienting the patient about what happened to himself. It is a selective or total kind of disorientation in which the patient refuses to accept his condition. Thus, it is concluded that the denial may be the result of TBI with specific lesions in the parietals lobes or be a way of manifesting a psychological protective mechanism to facilitate the patient in the management of reality. The fourth and last category of disorientation is that associated with confusion in the patient who has an inability to identify people from his environment and make proper use of their names. The results of a craniocerebral injury appear to contain a wide range of deficits involving almost all cognitive functions. This fact should be taken seriously in any rehabilitation program for these patients.

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