Brain Injury and memory

Experience, Memories

A brain injury, also called head injury or traumatic brain injury refers to an injury where there is damage to the brain because of an external blow to the head. A " brain injury" or " closed head injury" occurs when there is a blow to the head as in a motor vehicle accident or a fall. It is the most common type of traumatic brain injury. However, other brain injuries, such as those caused by insufficient oxygen, poisoning, or infection, can cause similar deficits In any case, the skull hits a stationary object and the brain, which is inside the skull, turns and twists on its axis (the brain stem), causing localized or widespread damage.

Also, the brain, a soft mass surrounded by fluid that allows it to " float," may rebound against the skull resulting in further damage (Anderson and Moore, 1995). Traumatic brain injury (TBI) can significantly affect many cognitive, physical, and psychological skills. Physical deficit can include ambulation, balance, coordination, fine motor skills, strength, and endurance. Cognitive deficits of language and communication, information processing, memory, and perceptual skills are common. Psychological status is also often altered.

Adjustment to disability issues are frequently encountered by people with TBI. Mild Traumatic Brain Injury (MTBI) is characterized by one or more of the following symptoms: a brief loss of consciousness, loss of memory immediately before or after the injury, any alteration in mental state at the time of the accident, or focal neurological deficits. In many MTBI cases, the person seems fine on the surface, yet continues to endure chronic functional problems. Some people suffer long-term effects of MTBI, known as postconcussion syndrome (PCS)(Russ, et al. 1993).

People suffering from PCS can experience significant changes in cognition and personality. Most traumatic brain injuries result in widespread damage to the brain because the brain ricochets inside the skull during the impact of an accident. Diffuse axonal injury occurs when the nerve cells are torn from one another. Localized damage also occurs when the brain bounces against the skull. The brain stem, frontal lobe, and temporal lobes are particularly vulnerable to this because of their location near bony protrusions. The brain stem is located at the base of the brain.

Aside from regulating basic arousal and regulatory functions, the brain stem is involved in attention and short-term memory. Trauma in this area can lead to disorientation, frustration, and anger. The limbic system, higher up in the brain than the brain stem, helps regulate emotions. Connected to the limbic system are the temporal lobes which are involved in many cognitive skills such as memory and language. Damage to the temporal lobes, or seizures in this area, have been associated with a number of behavioral disorders. The frontal lobe is almost always injured due to its large size and its location near the front of the cranium.

The frontal lobe is involved in many cognitive functions and is considered our emotional and personality control center. Damage to this area can result in decreased judgement and increased impulsivity. Brain injury has a great influence on memory especially to the memory pf those with impaired memory. I would like now to take a closer look to the types of the memory in order to see how it is connected with brain injury. As it is known information going into the brain is processed at several stages. First minutes we remember something refers to immediate memory.

It includes briefly save information that will be not needed in a short period after it was received. With people who have a head injury, immediate memory can be " good" or it can be " bad. " The problem for most head-injured people, however, is with short-term memory (STM). This kind of memory is defined as a working memory which process information from the sensory registers (Charles G. Morris and Albert A. Maisto). In case one focuses the attention on a stimulus in the sensory register, it is automatically saved in this/her STM. STM lasts until the new information is stored and takes a place of the old one.

Some of the information that went through the STM will disappear and some will be converted to your log-term memory (LTM). Studies suggest that STM can hold about as much information as can be repeated or rehearsed in 1. 5 to 2 seconds. The next type of memory or saying, the next stage of transformation the information is the information that we recall after a day, a week or year. It refers to a Long-term memory (LTM). LTM has a quite different capacity than STM. Information is not stored for a short period, but can be stored for many years.

We encode our memories in many ways, including shapes, sounds, smells, tastes, and other ways. When we attempt to remember a list of items we are usually more likely to remember the first items (primary effect) and the last items than the middle items. This is called the serial position effect. For most head-injured people, their long-term memory tends to be good. After one get a head injury, short-term memory isn't working, so information has a hard time getting to long-term memory. For example, head-injured people may double or triple their usual study time in preparing for a test the next day.

By the time they get to the exam, they are completely blank on the material. The little events of the day are sometimes forgotten, making life " fly by" when the one looks back at events that have happened since the injury. When speaking of brain injury and memory it is important to mention two common things that happen with people with head injuries: retrograde and anterior grade amnesia. Amnesia means you lost a memory that you once had. It's as if someone has erased part of your past. Retrograde amnesia means you have lost memories for events PRIOR to the accident.

For some people, retrograde amnesia can cover just a minute or even a few seconds. In other words, they'll recall the car coming right at them but are unable to recall the moment of impact. For other people, retrograde amnesia may affect longer periods of time. The last three or four hours prior to the accident are gone. I had one individual who had lost the last year of his life. As people get better from their head injuries, long-term memories tend to return. However, memories tend to return like pieces of a jigsaw puzzle; these bits and pieces return in random order.

In general, the smaller the degree of retrograde amnesia, the less significant the head injury is (Spreen et al. , 1995). Another form of memory loss is called anterior grade amnesia. In this case, events FOLLOWING the accident have been erased. A good part of that is due to the brain injury itself. Complex systems in the brain are injured. The chemical balance in the brain is upset. As brain chemistry normalizes and brain systems begin working, memory also starts to work. I've had patients who have spent several months in the hospital but are only able to recall the last to two to three weeks of their stay.

There are reasons why the STM does not work in those who have brain injury. The reason lies in the way the brain works. As we know the information flows in through the middle of our brain and branches out like a tree. Before that information goes to different areas, it goes through a channeling/filtering system. It's almost like a mail room--this information goes into this box, and that letter goes into that box. When the brain is injured, these middle areas get pressed upon because of swelling (pressure pushes down on the brain). The middle sections of the brain are also resting on the bone of the skull.

Because of forward and backward movement of the brain in an accident, they get sheered or torn. A problem develops when there is a large flow of information coming in which the brain can't process, or when information is not being sent to the right place. So the mail room of the brain is not doing its job. There is also a second type of memory problem. Once information is stored in the brain, the brain has a hard time finding it. For example, you saw a movie but you can't recall the name of the actor in the movie. You can visualize who the actor is, but can't come up with his name.

People typically describe a " tip of the tongue" type of thing--" I know what I want to say but I just can't get it out". It’s almost as if the brain is saying, " searching, searching" and not finding. Several minutes later, it just comes to you. So there are basically two kinds of memory problems: storage problems and retrieval problems. In conclusion I would like to say that it is very important to improve the memory and make regular exercise which will contribute to this process. The known fact is that people use their memory

not to the fullest extent and not even to the half of their remembering abilities.

Bibliography:

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