

Course-CC-6 (Neuropsychology) Unit 2; Sem II

By

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TRAUMATIC HEAD INJURIES

Brain injury is a common result of automobile and industrial accidents; cerebral trauma or injury from a blow to the head is the most common form of brain damage in people under the age of 40.

The two most important factors in the incidence of head injury are

1. Age and
2. Sex.

Children and elderly people are more likely to suffer head injuries from falls than are others, and males between 15 and 30 years of age are very likely to incur brain injuries, especially from automobile and motorcycle accidents. A child's chance of suffering significant closed-head injury before he or she is old enough to drive is 1 in 30. Head injury can affect brain function by causing direct damage to the brain; by disrupting blood supply; by inducing bleeding.

There are two main types of head injury: open-head injury and closed-head injury.

Open-Head Injuries

Open-head injuries are traumatic brain injuries in which the skull is penetrated, as in gunshot or missile wounds, or in which fragments of bone penetrate the brain substance. In many cases, the injury does not cause the victim to lose consciousness. Open-head injuries tend to produce distinctive symptoms that may undergo rapid and spontaneous recovery. The neurological signs may be highly specific,

and the effects of the injuries often closely resemble those of surgical excision of a small area of cortex.

Closed-head injuries are commonly accompanied by coma. According to Lezak, the duration of unconsciousness can serve as a measure of the severity of damage, because it correlates directly with mortality, intellectual impairment, and deficits in social skills. The longer the coma lasts, the greater the possibility of serious impairment and death. Two kinds of behavioural effects result from closed head injuries:

- (1) Discrete impairment of the specific functions mediated by the cortex at the site of the coup or countercoup lesion and
- (2) More generalized impairments from widespread trauma throughout the brain.

Discrete impairment is most commonly associated with damage to the frontal and temporal lobes, which are the area's most susceptible to closed-head injuries. Bright people are the most affected by closed-head injuries because they are acutely aware of any loss of cognitive skill that prevents them from returning to their former competence level.

Closed-head injuries that damage the frontal and temporal lobes also tend to have significant effects on personality and social behaviour. According to Lezak, relatively few victims of traffic accidents who have sustained severe head injuries ever resume their studies or return to gainful employment; if they do re-enter the work force, they do so at a level lower than that before their accidents. Often, the chronic effects of closed-head injuries are not accompanied by any obvious neurological signs, and the patients may therefore be referred for psychiatric evaluation. Thorough psychological assessments are especially useful in these cases for uncovering seriously handicapping cognitive deficits that have not yet become apparent. People who once sustain head injuries are more likely to sustain subsequent head injuries, and there is a strong suggestion in the literature that the effects of even very mild head injuries may be cumulative. For

example, it is well established that a boxer will sustain a significant level of brain injury—culminating in a condition called *traumatic encephalopathy* (known more commonly as the “punch-drunk syndrome”)— even though the periods of unconsciousness experienced by the boxer may have been few and of short duration.

Behavioural Assessment in Head Injury

Behavioural symptoms of brain injury are coma and amnesia. Clinical judgment of the depth of coma was largely subjective and unreliable until the Glasgow Coma Scale was designed to provide an objective indicator of the degree of unconsciousness and of recovery from unconsciousness.

In this scale, three indices of wakefulness are evaluated:

- I. Eye opening,
- II. Motor response, and
- III. Verbal response.

A score of 8 or less is often used as a criterion for severe closed-head injury, with a score ranging from 9 to 12 being a criterion for moderate injury. A shortcoming of the scale as a measure of the severity of brain injury is that as many as 50% of brain injury victims admitted to hospitals have scores ranging from 13 to 15, indicating an absence of coma, and yet later such patients may suffer many of the consequences of head injury. The length of posttraumatic amnesia is an alternative measure of severity of injury.

Even though definitions of posttraumatic amnesia vary (some include the period of coma, whereas others are restricted to the period of anterograde amnesia), there is good evidence that the duration of amnesia is correlated (imperfectly) with later memory disturbance. A commonly used scale is as follows:

- I. amnesia lasting less than 10 minutes corresponds to very mild injury; amnesia lasting 10 to 60 minutes corresponds to mild injury;
- II. Amnesia lasting 1 to 24 hours corresponds to moderate injury.

III. Amnesia lasting 1 to 7 days corresponds to severe injury; amnesia lasting more than 7 days corresponds to very severe injury.

One problem with using amnesia as a measure is that there is no consistent method of measuring it. Researchers evaluate it, variously, by retrospective questioning, by measures of disorientation, or by neuropsychological assessment, and each method yields a different estimate of the severity of amnesia and hence of the extent of injury

Recovery from Head Injury

Although it is often stated that recovery from head trauma may continue for 2 to 3 years, there is little doubt that the bulk of the cognitive recovery takes place in the first 6 to 9 months. Recovery of memory functions appears to be somewhat slower than recovery of general intelligence, and the final level of memory performance is lower than that of other cognitive functions

Although the prognosis for significant recovery of cognitive functions is good, there is less optimism about the recovery of social skills or normal personality, areas that often change significantly.

The results of numerous studies support the conclusion that the quality of life—in regard to social interactions, perceived stress levels, and enjoyment of leisure activities—is significantly reduced after closed-head injury and that this reduction is chronic. There have been few attempts to develop tools to measure changes in psychosocial adjustment in brain-injured people; so we must rely largely on subjective descriptions and self-reports, which provide little information about the specific causes of these problems.

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