



ORIGINAL RESEARCH PAPER

Neurosurgery

POST TRAUMATIC NEURO PSYCHIATRIC CHANGES IN DIFFUSE AXONAL INJURY

KEY WORDS:

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ABSTRACT

INTRODUCTION: To study post traumatic neuropsychiatric changes in all patients admitted in a peripheral tertiary care center with head injury, GCS in between 8 to 13 and subsequently improved to GCS 14 to 15.

MATERIALS AND METHODS: This is a retrospective study, having a group of patients of age group 14 to 50 years of age, admitted and treated from August 2018 to July 2019, all patients having Glasgow Coma Score of 8 to 13 at the time of admission. Total number of patients 45.

INCLUSION CRITERIA:

- Patients age group in between 14 years to 50 years.
- GCS in between 8 to 13 at the time of admission.
- CT scan brain having normal study.

EXCLUSION CRITERIA:

- Patients below the age of 14 years and above 50 years
- Patients having other visceral and skeletal injuries.
- Patients having GCS less than 7 and 14 to 15.
- Patients having previous history of psychiatric disorders.
- Patients having previous head injury.
- Patients unwilling to be included in study group.

RESULTS: Diffuse axonal injury patients having GCS 8 to 13 at the time of admission, after treatment and having GCS 14 to 15 and significant neuropsychiatric changes. Also the result is dependent on the mode of head injury, age group of patients, time of arrival to hospital. Some factors got improved and some factors got worsened.

CONCLUSION: Although the patients with diffuse axonal injury admitted with GCS 8 to 13 and discharged with GCS 14 to 15, there are significant neuropsychiatric changes at the time of discharge which are required to be considered for rehabilitation.

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INTRODUCTION

Traumatic brain injury (TBI) occurs when a blow or jolt to the head. It may result in mild to severe to the brain parenchyma. Diffuse axonal injuries (DAI) results from severe acceleration or deceleration of the head. Patients remain severely disabled or unconscious. Patients with diffuse axonal injuries, have significant residual neuropsychiatric complications which include seizures, dementia, depression, posttraumatic stress disorder (PTSD), generalized anxiety disorder (GAD), obsessive-compulsive disorder (OCD), and other cognitive and behavioral sequelae.

Cerebral atrophy, dilatation of the lateral and third ventricle, and thinning of the corpus callosum were noted in DAI patients. Microscopic appearance showed punctuate hemorrhagic lesions to the axons in the corpus callosum, superior parasagittal cerebral white matter, brainstem. DAI results in changes in the levels of neurotransmitters which lead to neuropsychiatric manifestations. This study is aimed at evaluating the residual neuropsychiatric manifestations and to establish the need for rehabilitatory measures in such patients.

MATERIALS AND METHODS

This is a retrospective study, having a group of patients of age group 10 to 50 years of age, admitted and treated from August 2018 to July 2019, all patients having Glasgow Coma Score of 8 to 13 at the time of admission. Total number of patients 45.

Inclusion criteria:

- Patients age group in between 14 years to 50 years.
- GCS in between 8 to 13 at the time of admission.
- CT scan brain having normal study.

- Patients with no other confounding factors (comorbid conditions / fluid – electrolyte abnormalities)

Exclusion criteria:

- Patients with age less than 14 and more than 50 years
- Patients having other visceral and skeletal injuries.
- Patients having GCS less than 7 and 14 to 15.
- Patients having previous history of psychiatric disorders.
- Patients having previous head injury.
- Patients unwilling to be included in study group.

Assessment of the patients was done during time of discharge with Frontal assessment battery and Montreal cognitive assessment (MOCA)

RESULTS

Comparison of Frontal assessment battery score (FAB) and MOCA. MOCA score gives a better picture about the cognitive dysfunction and higher percentage of people are being categorized as needing rehabilitation. So MOCA is a better predictor of establishing the need for rehabilitation.

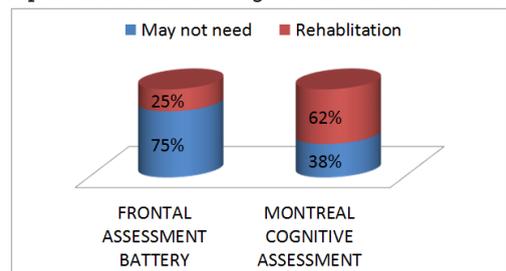


FIG.1

Time since injury is less than 4 hours FAB scores were made 77% of patients not needed rehabilitation .

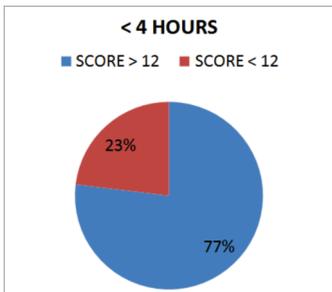


FIG.2

Time since injury > 4 hours 74% patients does not needs rehabilitation as per FAB score.

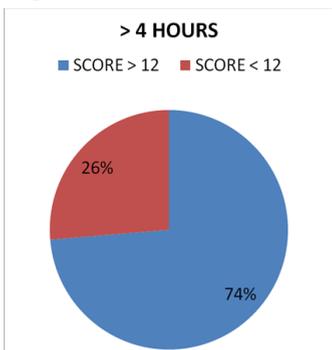


FIG.3

Time since injury is less than 4 hours MOCA scores were made 50 % of patients needed rehabilitation

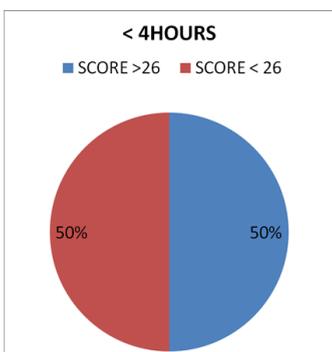


FIG.4

Time since injury is more than 4 hours MOCA scores were made 79 % of patients needed rehabilitation

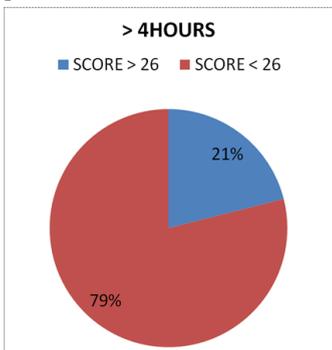


FIG.5

Less number of people in each age group ere categorized as

needing rehabilitation as per FAB .

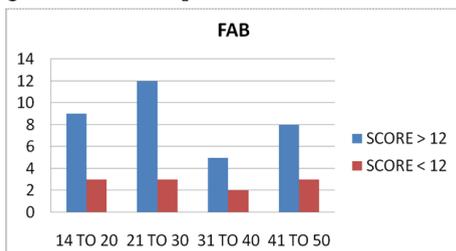


FIG.6

More number of people were categorized as needed for rehabilitation as per MOCA score in each age group.

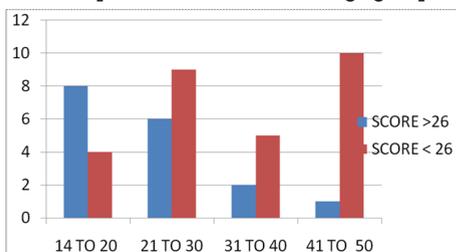


FIG.7

DISCUSSION

Diffuse axonal injury symptoms can be explained by cytotoxic processes such as Ca+2 and Mg+2 dysregulation, neurotransmitter excitotoxicity, free radical-induced injury. Many studies showed that Damage to the ascending monoaminergic projections may cause pathological functioning of the systems dependent on these pathways such as decrease in dopamine levels. Attention and memory deficits are the most common cognitive difficulties reported by patients and their families. Executive functioning controlled by prefrontal cortex is the next common impairment in DAI. This leads to poor quality of life, impairment of daily functions of life and loss of job functions .

The goals of management of head injury patients include a variety of domains including drugs and rehabilitative techniques. Drugs that increase dopaminergic transmission have shown improvement in cognitive functions (e.g., arousal, speed of processing, attention, and memory).

The aim of the management is to help the patient achieve his optimal level of functioning. The level of disability at various stages following DAI needs to be assessed very clearly to look for the amount of recovery made in various spheres. Those with relatively mild injuries may require a brief period of rehabilitation and then may return essentially to their premorbid status. Others, however, will have severe, lifelong deficits that require a shift from a medical treatment model to a psychosocial and environmental support model over time.

Various Rehabilitatory Measures

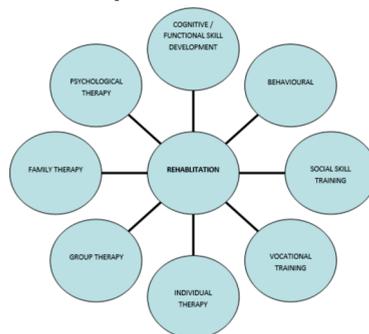


FIG.8

Pharmacological Rehabilitation

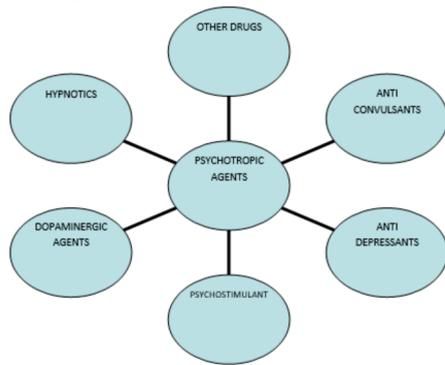


FIG. 9

CONCLUSION

An intensive team approach is needed to collaborate with the expertise of psychiatrists, neurologists, and psychologists for the efficient management of the patients. A careful assessment is required to get an accurate description of patient's functional and neurobehavioral status after the injury. Patients experiencing suicidal thoughts need aggressive psychological rehabilitation and care. In addition, care givers have to be trained specially to take care of such patients. Future studies are to be focused on understanding if there are improved outcomes in the patients who are under the care of such trained care givers. Such studies proved with evidence can help us focus on improving the quality of life for both the patients and also the care givers. In conclusion, collaborative efforts are needed to continue and support research in this field in future, for accommodating better treatment and rehabilitative options to the patients who suffer DAI.

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