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Effect of Cerebroprote in Hydrolysate Inmanagement of Mild And Moderate Traumatic Brain Injury-An Institutional Study

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Abstract
Introduction*: Traumatic brain injury occurs when external force injures the brain which may include falls, violence and vehicle collisions leading to more diffuse injury causing cognitive and neuro psychiatric disturbances. Cerebroprotein hydrolysate is a peptide preparation with similar action as neurotrophic factors thus improving neurogenesis in cases of traumatic brain injury.*
Objectives: *We attempt to determine the beneficiary effects of cerebroprotein hydrolysate and its clinical outcome in management of traumatic brain injuries in our institution.*
Material and Methods: *This is a prospective study comprising of 300 patients admitted in Department of Neurosurgery, Government Medical College and Hospital, Guntur, Andhra Pradesh for a period of 2 years (March 2015- march 2017).*
Results: *300 patients were included in this study in a period of 2 years where in 210 were Male and 90 were Female.Patients were randomly divided into 2 groups. Group A and Group B with 150 patients in each group. Group A were treated with cerebroprotein hydrolysate after head injury. Group B patients did not receive the drug instead they were treated routinely. GCS in Group A patients at the time of admission for 70 patients was mild Traumatic brain injury and 80patients with moderate TBI. Where as in Group B 80 patients had mild traumatic brain injury and 70 had moderate traumatic brain injury. On assessing patients 3week post cerebroprotein infusion, amongst Group A, 110 were with mild and 40 were with moderate category of traumatic brain injury. Whereas 90 were with mild and 60 were with moderate category of traumatic injury in Group B.*
Conclusion: *Cerebroprotein hydrolysate infusion has a beneficial effect in managing cases of acute traumatic brain injury and is safe and well tolerated by the patients.*
Keywords: *Traumatic brain injury(TBI), Cerebroprotein hydrolysate.*

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I. Introduction

Theterm Traumatic Brain Injury (TBI) refers to nonpenetrating brain injury and are classified into mild, moderate, severe categories[1].Glasgow Coma Scale (GCS) is the most commonly used system for classifying TBI severity. Traumatic brain injury with a GCS of 13 or above is mild, 9–12 is moderate, and 8 or below is severe[2,3]. Other classification systems include post traumatic amnesia and loss of consciousness.
Cerebroprotein hydrolysate, a peptide preparation with neuroprotective properties reduces neuronal dysfunction and helps in cases of traumatic brain injury.

II. Aims And Objectives

To determine the effects of cerebroprotein hydrolysate on functional recovery in patients with disability after traumatic brain injury admitted in Department of Neurosurgery, Guntur medical college and hospital, Guntur from a period of march 2015 to march 2017 in comparison with patients who did not receive cerebroprotein hydrolysate post traumatic brain injury.

III. Materials And Methods

This is a prospective study comprising of 300 patients admitted in Department of Neurosurgery, Guntur Medical College and Hospital, Guntur, Andhra Pradesh for a period of 2 years (March 2015- August 2017). The purpose of this study is to evaluate the effect of cerebroprotein hydrolysate in initial management of traumatic brain injuries.

Data regarding the particulars of patient, clinical history, examination, diagnosis, GCS during admission, 1 week and 3weeks and 6months after cerebroprotein hydrolysate infusion was collected and analyzed.

IV. Inclusion And Exclusion Criteria

Patients with traumatic head injury who are treated conservatively and falling under the age group of 18-70yrs are included in this study. Patients with severe traumatic brain injury, patients with polytrauma andassociated systemic disorders, patients who refuse to give consent or those who are not on follow up for a minimum period of 6 months and patients who fall under the age of 18years and above 70yearss are excluded from the study.

Results

300 patients with traumatic brain injury were admitted in a period of 2 years where in 210 were Male and 90 were Female.

Sex of patients	No. of patients	Percentage
No. of Males	210	70%
No. of females	90	30%

Out of 30, 83.3% of the patients were under the age group of 41-50yrs.

Age of patients	No. of patients	Percentage
18-40yrs	20	6.66%
41-50yrs	250	83.3%
51-70yrs	30	10%

Patients were randomly divided into 2 groups. Group A and Group B with 150 patients in each group. Group A were treated with cerebroprotein hydrolysate after head injury. Group B patients did not receive the drug instead they were treated routinely. GCS in Group A patients at the time of admission for 70 patients was mild Traumatic brain injury and 80 patients with moderate TBI. Where as in Group B 80 patients had mild traumatic brain injury and 70 had moderate traumatic brain injury.

During admission	Pts with Mild traumatic brain injury	Pts with Moderate traumatic brain injury
Group A	70	80
Group B	80	70

After 1 week	Pts with Mild traumatic brain injury	Pts with Moderate traumatic brain injury
Group A	90	60
Group B	80	70

On assessing patients 3 weeks post cerebroprotein infusion, amongst Group A, 10 were with mild and 5 were with moderate head injury without any drug reactions.. 9 were with mild and 6 were with moderate head injuryin Group B.

After 3 weeks	Pts with Mild traumatic brain injury	Pts with Moderate traumatic brain injury
Group A	110	40
Group B	90	60

With regular followup after discharge and patient on antiepileptics aloneafter 6 months of head injury, 138 patients from groupA recovered completely without any focal neurological deficits whereas 112 patients from groupB recovered completely without any focal neurological deficits.

After 6 months	No. of patients recovered without any focal neurological deficits	Percentage of patients who recovered without any focal neurological studies(%)
Group A	138	92
Group B	112	74.6

No allergic drug reactions were noted in both the groups.

V. Discussion

Traumatic brain injuries are leading cause of morbidity, mortality, anddisability in India and other developing countries[4]. Nearly 1.5-2 million people are injured and one million deaths are recorded every year due to Traumatic brain injuries. Road traffic accidents are the leading cause for traumatic brain injuries accounting up to 60% of all causes followed by falls (20-25%) and violence 10%. Compared to other types of brain insult, traumatic brain injury produces more diffuse injury causing more cognitive and neuropsychiatric disturbances.[5]

Cerebroprotein hydrolysate is a peptide preparation with similar action as neurotrophic factors and has beneficial effects on brain injury, stroke and neurodegenerative diseases. It is derived from purified brain proteins by standardized enzymatic proteolysis, with neuroprotective properties[6]. Cerebroprotein hydrolysate reduces neuronal dysfunction by maintaining the integrity of neurons under adverse conditions and increases neurogenesis. Early treatment with intracerebroventricular infusion of cerebroprotein hydrolysate reduces blood brain barrier permeability and brain edema thus improves functional recovery[7]. According to a study by Yanlu Zhang et al.,2015, cerebroprotein hydrolysate enhances number of neuroblasts, which may be associated with improved special learning. It also supports adult neurogenesis in hippocampus which contributes to improvement in cognitive functional recovery after mild traumatic brain ionjury.A recent clinical trial showed that cerebroprotein hydrolysate improves cognitive function in patients with mild traumatic brain injury 3months after injury, which indicate that cerebroprotein hydrolysate has potential in treatment for brain injury[8]. Treatment with Cerebroprotein hydrolysate significantly increases number of DCX-expressing neuroblast and newborn mature neurons in dentate gyrus and significantly reduces brain amyloid precursor protein accumulation and astrocyte activation[9]. Cerebroprotein hydrolysate improves cognitive function with significant negative correlation with astrocyte activation, suggesting that astrocyte activation may play important role in long term cognitive impairments after traumatic brain injury.It counteracts, destructive effects of glutamate and reversibly inhibits calpain thus prevents ion-induced neurodegeneration, decreases brain demand for oxygen, increased resistance to hypoxia-ischaemia and significantly decreases lactate level[10].

VI. Conclusion

Results suggest a beneficial effect of cerebroprotein hydrolysate infusion in patients with mild and moderatetraumatic brain injury. It is safe, can be well tolerated and is associated with improved functional recovery.

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