

## EFFECT OF CEREBROLYSIN ON MENTAL HEALTH

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## ABSTRACT

**Background:** Traumatic brain injury is the most common cause of death following trauma<sup>[3]</sup>, which in turn is among the major causes of deaths among young people. The aim of this study is survey the effect of cerebrolysin on patients with traumatic brain injury. **Methodology:** After gaining permission of the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences, 25 traumatic brain injury (TBI) patients were included in a double-blind study. The patient received 10 cc of cerebrolysin per day for a week. The level of their consciousness was evaluated by using the MMSE scale one month after intervention. The data was evaluated using SPSS-22. **Results:** 25 patients participated in this study that one of them were female(4%) and 24 were male(96%). The mean age of patients was  $29/56 \pm 10.02$ . In this study 15(60%) patient have good MMSE status and 10(40%) of them have bad status that among this patient one women exist and have

bad status and 9 man have bad and 15 man have good status. **Discussion:** Cerebrolysin can effect on mental status of patients But more research is needed to determine the significance level.

**KEYWORDS:** cerebrolysin, traumatic brain injury, MMSE Scale.

## INTRODUCTION

The incidence of traumatic brain injury (TBI) differs among countries<sup>[1]</sup> as there are variations regarding frequency of traffic accidents, safety in work places and transportation, frequency of assaults and gun shots in the civilian society and, not least, participation in war with the increasing incidence of blast injuries.<sup>[2]</sup> Traumatic brain injury is the most common cause of death following trauma,<sup>[3]</sup> which in turn is among the major causes of deaths among

young people. For patients with severe head injury admitted alive to hospital, the mortality from the head injury is 25-40 %, depending on whether all age groups are included, and whether patients admitted alive, but with signs of herniation and no hope of survival are included. Mortality from TBI is probably decreasing. From the Traumatic Coma Data Bank, mortality after severe TBI (age 16-65) was 39 % in 1984-87, versus 27 % in 1988-96.<sup>[4]</sup> The goal of treatment in TBI is to ameliorate progression of secondary injury. Numerous neuroprotective compounds have been investigated for TBI.<sup>[5]</sup> A recent review concluded that nearly all phase II/III clinical trials in neuroprotection have failed to show any consistent improvement in outcome for TBI patients.<sup>[6]</sup> Because the pathology of CNS trauma involves so many different but intertwined mechanisms, disappointing outcomes have resulted in calls to consider targeting multiple injury mechanisms simultaneously.<sup>[7,8]</sup> An alternative approach is to prevent an early secondary event that is critical for triggering or exacerbating other mechanisms of secondary injury that unfold later. A prominent example of such an early key event is secondary hemorrhage. Known in the vernacular as ‘blossoming’ of a contusion, secondary hemorrhage is certainly one of the most devastating forms of secondary injury since many other secondary injury processes are initiated or exacerbated by the extravasated blood, including oxidative stress, inflammation, edema, cell death, mass effect, and increased intracranial pressure (ICP). Reducing secondary hemorrhage after CNS trauma may have profound effects on overall outcome.<sup>[9]</sup> Cerebrolysin is a pharmaceutical composition composed of low-weight nerve stimulator peptides and amino acids. This medicine has been applied to different cases in some European and Asian countries. Very little side effects of this medicine have been reported so far. Shi et al. (1990) for the first time used this medicine to treat patients with hemorrhagic stroke.<sup>[10]</sup> Cerebrolysin has also been used as an effective treatment for acute ischemic stroke.<sup>[11]</sup> This medicine increases the neurons intake of oxygen and thus reduces the concentration of lactic acid and free radicals. In numerous studies, Cerebrolysin has also demonstrated its effectiveness for neural improvement.<sup>[12,13]</sup> Cerebrolysin leads to a considerable improvement in the cognitive and noncognitive activities of Alzheimer patients. It also leads to the enhancement of symptoms and daily activities of patients suffering from stroke.<sup>[14,15]</sup> Plosker et al. reported the effectiveness of Cerebrolysin for treatment of vascular dementia. The measurement of outcome after traumatic brain injury is complex. The Glasgow Outcome Scale (GOS) is widely used in epidemiological research, particularly in neurosurgical patients. There are categories: death, vegetative state, severe disability, moderate disability and good recovery. These scales are less useful in rehabilitation, as sensitivity remains an issue. Much debate has centred on how to measure

outcome from rehabilitation. Measurement tools should be valid, reliable, sensitive to change and relevant to the intervention. There is no one instrument that is suitable to assess outcome for all patients at all stages. The mini-mental state examination (MMSE) or Folstein test is a sensitive, valid and reliable 30-point questionnaire that is used extensively in clinical and research settings to measure cognitive impairment<sup>[16]</sup> It is commonly used in medicine and allied health to screen for dementia. It is also used to estimate the severity and progression of cognitive impairment and to follow the course of cognitive changes in an individual over time; thus making it an effective way to document an individual's response to treatment. The MMSE's purpose has been, not on its own, intended to provide a diagnosis for any particular nosological entity.<sup>[17]</sup> The aim of this study is survey the effect of cerebrolysin on patients with traumatic brain injury.

## METHODOLOGY

After gaining permission of the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences, 25 traumatic brain injury (TBI) patients were included in a double-blind study. The inclusion conditions are as follows: TBI patients must be over 18 years, refer to Ahvaz Golestan hospital, and a maximum of 48 hours has passed since their acceptance. Patients who had one of the following were excluded: severe kidney, liver, lung or heart diseases, loss of consciousness due to the use of drugs or alcohol, patients with a history of stroke, pregnant patients, patients with multiple life-threatening traumas, patients who have evidence of brainstem dysfunction, patients who have evidence of Grand mal seizure and status epilepticus. The patient received 10 cc of cerebrolysin per day for a week. The level of their consciousness was evaluated by using the MMSE scale one month after intervention. The data was evaluated using SPSS-22.

## RESULT

25 patients participated in this study that one of them were female(4%)(Table 1) and 24 were male(96%). The mean age of patients was  $29/56 \pm 10.02$ . (Table 2)

**Table 1: Sex Frequency.**

		sex			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	24	96.0	96.0	96.0
	Female	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

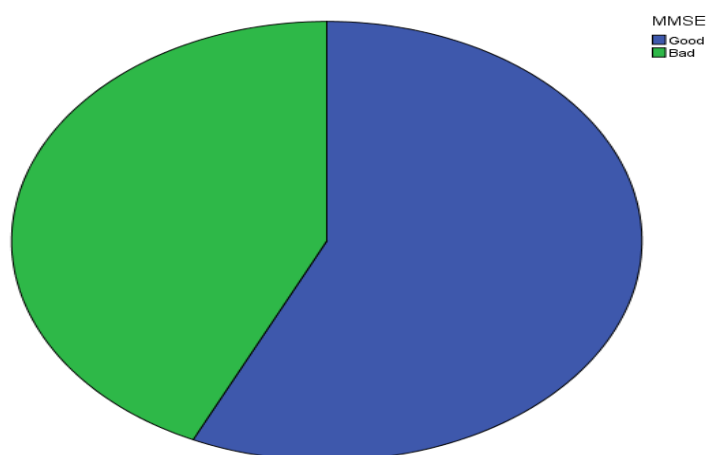
**Table 2: Age Descriptive status**

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	25	17.00	50.00	29.0000	10.02530
Valid N (listwise)	25				

In this study 15(60%) patient have good MMSE status and 10(40%) of them have bad status (Table 3 and Fig1)

**Table 3: MMSE Status.**

MMSE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Good	15	60.0	60.0	60.0
	Bad	10	40.0	40.0	100.0
	Total	25	100.0	100.0	

**Fig 1. MMSE Status**

It should be noted that among this patient one women exist and have bad status and 9 man have bad and 15 man have good status.

## DISCUSSION AND CONCLUSION

Traumatic brain injury (TBI) is devastating with catastrophic consequences. Early recognition of injury and prompt delivery of focused care of the traumatic brain injured patient is essential to patient outcome.<sup>[18]</sup> TBI still represents the leading cause of morbidity and mortality in individuals under the age of 45 yr in the world. The principal mechanisms of

TBI are classified as (a) focal brain damage due to contact injury types resulting in contusion, laceration, and intracranial haemorrhage or (b) diffuse brain damage due to acceleration/deceleration injury types resulting in diffuse axonal injury or brain swelling.<sup>[19]</sup> Cerebrolysin is a peptide preparation for IV infusion which mimics the action of neurotrophic factors. The compound is produced by a biotechnological process, a controlled hydrolysis of purified brain proteins, and consists of low-molecular-weight neuropeptides and free amino acids. Cerebrolysin has been shown to exert neurotrophic as well as neuroprotective effects in vitro and in vivo. It induces neurite outgrowth and reduces apoptosis triggered by growth factor withdrawal in cultivated neurons. So this drug can be useful treatment traumatic brain injury.<sup>[20-22]</sup> As the result showed, 25 patients participated in this study that one of them were female(4%) and 24 were male(96%).The mean age of patients was  $29/56 \pm 10.02$ . In this study 15(60%) patient have good MMSE status and 10(40%) of them have bad status that among this patient one women exist and have bad status and 9 man have bad and 15 man have good status. Cerebrolysin can effect on mental status of patients But more research is needed to determine the significance level.

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