

The Clinical Efficacy of Usage of Albumin Solution in the Treatment of Brain Edema in Acute Hemorrhagic Stroke

Nigora Mirsalimovna Mukhamedjanova*

Alia International Hospital, Kuwait

***Corresponding Author:** Nigora Mirsalimovna Mukhamedjanova, Alia International Hospital, Kuwait.

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Abstract

The brain edema is a leading cause of death in most urgent neurologic conditions like Severe Head Injury, Acute Ischemic and Hemorrhagic Stroke.

Keywords: Brain Edema; Acute Stroke; Albumin; Mannitol; Treatment

Introduction

Surprising as it may sound cerebral edema is a fairly common pathophysiological entity which is encountered in many clinical conditions. Many of these conditions present as medical and surgical emergencies. By definition cerebral edema is the excess accumulation of water in the intra-and/or extracellular spaces of the brain [1].

The Treatment is aimed at: 1) decreasing the brain edema in ischemic (hemorrhagic zone) and perifocal ischemic brain tissue 2) earliest isolation of necrotic zone of the brain.

For the first purpose Mannitol or Albumin can be used while for the second purpose should be used Inhibitors of Proteolytic Enzymes (Contrical, Gordox, Aprotinin).

Case Report

58 year old Indian male with history of Arterial Hypertension and Diabetes Mellitus 2 type suddenly developed the right side Hemiplegia, Hemianesthesia, motor aphasia, he collapsed in the bathroom, vomited many times. At the moment of observation the man's consciousness was soporific, had obvious Central palsy of VII, XII cranial nerves on the right side, Hemiplegia, positive pathologic symptoms of Babinski, Oppenheim on the right side. Blood pressure was 260/120 mm/hg. One hour later the patient fell into coma condition. He had been intubated and put for hyperventilation regime with 28 breaths per minute to prevent the brain edema. On CT brain: massive left sided hemispherical acute hematoma.

For the treatment of brain edema was used Albumin 20% - 100 ml intravenous once a day, for 6 days, Aprotinin 100 ml intravenous for isolation of necrotic zone in the brain. In 4 days after the beginning of the stroke the patient regained his consciousness and extubated himself. At the same time to other patients with Acute Ischemic Stroke in coma condition was given Mannitol 100 ml intravenous and didn't get any significant improvement of their consciousness and general condition.

Discussion

Mannitol is Osmotic Diuretic and is usually used for the treatment of brain edema but contraindicated in renal and liver function impairment, cardiovascular insufficiency, hyperosmolar syndrome, hypovolemia and hyperglycemia. Hyperosmolar Syndrome usually happens in Acute Ischemic stroke, severe Head injury and after Neurosurgical operations. In condition of disturbed vascular regulation and Hemato-encephalic barrier Mannitol leads to increasing of local intratissue pressure and electrolyte disbalance. Albumin decreases the swelling of damaged brain tissue [1-5], Mannitol acts to normal brain tissue [6-9]. Albumin decreases swelling in any organ and tissue as well as in brain, especially in condition of disturbed vascular regulation and Hemato-encephalic barrier.

Conclusion

Though there has been good progress in our understanding of pathophysiological mechanisms associated with cerebral edema more effective treatment is required. Certainly, the “ideal” agent for the treatment of cerebral edema- one that would selectively mobilize and/or prevent the formation of edema fluid with a rapid onset and prolonged duration of action, and with minimal side effects, remains to be discovered. As shown or clinical case, Albumin is most effective agent for the treatment of brain edema in Acute Hemorrhagic Stroke and leads to rapid improvement of general and Neurologic Status of the patient especially in combination with Inhibitors of Proteolytic Enzymes.

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