



## A PROSPECTIVE COMPARITIVE STUDY IN PATIENTS WITH INTRA VENTRICULAR HEMORRHAGE TREATED WITH EXTERNAL VENTRICULAR DRAINAGE ALONE Vs EXTERNAL VENTRICULAR DRAINAGE WITH FIBRINOLYSIS BY UROKINASE

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### ABSTRACT

The term "intraventricular hemorrhage" (IVH) refers to bleeding into the ventricular system of the brain, which produces and circulates the cerebrospinal fluid toward the subarachnoid space. It may be the consequence of a hemorrhagic stroke or physical trauma. In order to treat severe subsequent intraventricular cast hemorrhage, our study used a modified ventricular puncture external drainage technique. Maintaining EVD patency, dissolving intraventricular blood clots, lowering ICP and the mass effect on the ventricular walls, assisting in the removal of potentially harmful blood breakdown products, quickening patient recovery, lowering the risk of hydrocephalus, and improving overall results. Intra ventricular fibrinolysis (IVF) hastened IVH clearance and appeared to carry little risk, according to these first investigations which were carried out earlier, despite variations in their kind, dosage and length of fibrinolytic treatment. Since then, cohort researches had been done to show the utility of Intra ventricular fibrinolysis (IVF) with external ventricular drainage for IVH patients exclusively. All have attested to the fact that IVF does not seem to cause new or recurrent hemorrhages and is useful in speeding up the removal of intraventricular clots. **AIM AND OBJECTIVES:** The aim of our study is to compare the overall clinical outcome of the patients with IVH treated with external ventricular drainage alone vs patients treated with external ventricular drainage and fibrinolysis with urokinase in terms of mortality, morbidity, post hemorrhagic shunt dependency rate.

**Methodology:** IVH severity is scored with Graeb et al score and 15 patients are taken in each wing

1) No Fibrinolytic therapy 2) Fibrinolytic therapy with urokinase

**Results :** Post EVD Graeb score is significantly low in patient with EVD + Fibrinolytic therapy (Paired 't' test) **Conclusion:** According to the present study, Fibrinolytic therapy with Urokinase considerably hastens the clearance the IVH and non significantly decrease the length of hospital stay. It did not correlate with higher incidence of rebleeding. This study provided evidence supporting the use of Urokinase for fibrinolytic therapy after ICH with IVH.

### KEYWORDS :

The term "intraventricular hemorrhage" (IVH) refers to bleeding into the ventricular system of the brain, which produces and circulates the cerebrospinal fluid toward the subarachnoid space. It may be the consequence of a hemorrhagic stroke or physical trauma. In order to treat severe subsequent intraventricular cast hemorrhage, our study used a modified ventricular puncture external drainage technique. Maintaining EVD patency, dissolving intraventricular blood clots, lowering ICP and the mass effect on the ventricular walls, assisting in the removal of potentially harmful blood breakdown products, quickening patient recovery, lowering the risk of hydrocephalus, and improving overall results. Intra ventricular fibrinolysis (IVF) hastened IVH clearance and appeared to carry little risk, according to these first investigations which were carried out earlier, despite variations in their kind, dosage and length of fibrinolytic treatment. Since then, cohort researches had been done to show the utility of Intra ventricular fibrinolysis (IVF) with external ventricular drainage for IVH patients exclusively. All have attested to the fact that IVF does not seem to cause new or recurrent hemorrhages and is useful in speeding up the removal of intraventricular clots. Patients with extremely raised ICP, those with quickly failing brainstem activity, or those with considerable deep or dominating brain damage are unlikely to benefit from fibrinolytic treatment.

IVH can vary from a partial casting of all the ventricles to a slight layering of the blood in the lateral ventricle's posterior horn. Poor outcomes are linked to the presence of IVH in the context of both ICH and SAH [1-3]. Due to the mass impact of the hemorrhage or the concomitant hydrocephalus caused by ventricular outflow blockage, IVH accompanied with hemorrhagic stroke raises intracranial pressure (ICP). The implantation of an external ventricular drain (EVD), which is typically done at the patient's bedside to monitor and control intracranial pressure (ICP) and aid in intraventricular blood drainage, is arguably the most common neurosurgery procedure performed. ICH and SAH are the most common causes of hemorrhagic strokes. The extension of ICH into the ventricles has been repeatedly shown to be an independent predictor of poor outcome in patients with ICH [4-5]. Young et al. [6] showed a high correlation between ventricular blood volume and bad result in a group of patients with supratentorial ICH

and IVH. They also found that individuals with more than 20 cc of interventricular blood generally had a poorer prognosis.

### MATERIALS AND METHODS

**STUDY POPULATION:** All patients with IVH requiring external ventricular drainage in the Department of Neurosurgery

**TYPE OF STUDY:** A Prospective Comparative study

**DURATION OF STUDY:** 2 years

**INCLUSION AND EXCLUSION CRITERIA INCLUSION:** All patients with IVH (Primary and secondary) requiring external ventricular drainage

**EXCLUSION:** 1. GCS 3/15 at the time of presentation 2. Age < 18 years and >70 years 3. Pre-existing coagulopathy 4. Time of presentation > 48 hours 5. Bleeding due to vascular anomalies (e.g. AVM, Aneurysms) 6. Pregnancy 7. Traumatic IVH Standard sterile aseptic precaution for external ventricular drainage Intraventricular urokinase given at a dose of 10000 IU 12th hourly in the EVD followed by clamping it for one hour, dose is repeated for 5 days and the EVD is removed if the patient is able to tolerate the closure of EVD for 24 hours. Repeat imaging (non contrast CT) at 2rd and 6th day

**SEVERITY OF IVH GRADING:** Graeb et al scoring

**PARAMETERS COMPARED:** 1) GCS at the time of admission and discharge 2) Duration of clearance the blood from ventricles

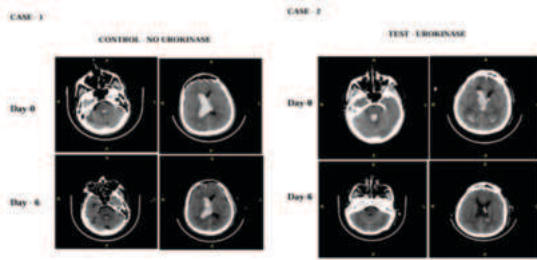
### RESULTS:

In the present study, majority of the patients in the control group (33.3%) belong to the age group of 40 and 50 years and more than 60 years, followed by 26.7% between 50 and 60 years of Age and 6.7% between 30 and 40 years. The Mean age of the Patients in the control group was 54.0667±10.10280 years with a minimum of 39 years and a maximum of 73 years. Majority of the patients (33.3%) in the test group were more than 60 years of age, followed by 26.7% between 40

and 50 years and between 50 and 60 years of Age and 13.3% less than or equal to 30 years of age. The Mean age of the Patients in the test group was  $50.4000 \pm 12.21124$  years with a minimum of 39 years and a maximum of 67 years.

A paired sample 't' test results of Pre-operative and Post-operative Graeb scores in the Test group. It can be inferred from the table that there is a significant difference in the Pre-Operative and Post-Operative Graeb Scores among the patients from the Test group as indicated by the significant p value of 0.000 ( $t=5.998$ ;  $df=14$ ). Thus, the pre-operative and post-operative Graeb score is significantly different in patients in the test group. The positive mean value represents decrease in Graeb score post operative procedure, when compared to control group. Which means fibrinolytic therapy helps in hastening the clearance of IVH.

It is also inferred that there is a non-significant reduction in duration of hospital stay and improvement in GOS in patient who received fibrinolytic therapy in EVD.



#### DISCUSSION :

In a prospective study, Tuhim et al. [4] investigated the prognostic significance and pathophysiologic implications of intraventricular extension of ICH. They found that patients with IVH had a significantly higher 30-day mortality rate and that there was a direct correlation between IVH volume and poor outcome. This correlation held true even after adjusting for the size of the associated ICH and the presence or absence of hydrocephalus, proving that IVH volume was a reliable indicator of poor outcome on its own. As per Von sangile et al [7], the benefits of IVF are not necessarily in improving outcomes, but more in aiding external drain management and possibly preventing ventriculitis.

**CONCLUSION:** According to the present study, Fibrinolytic therapy with Urokinase considerably hastens the clearance the IVH and non significantly decrease the length of hospital stay. It did not correlate with higher incidence of rebleeding. This study provided evidence supporting the use of Urokinase for fibrinolytic therapy after ICH with IVH.

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