

Effect of Glycerol Fructose Combined with Mannitol on Patients with Cerebral Hemorrhage and Cerebral Edema

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Abstract: *Objective:* To observe the effect of glycerol fructose combined with mannitol in the treatment of patients with clinical intracerebral hemorrhage complicated by cerebral edema and increased intracranial pressure, and to evaluate the clinical application value of this treatment. *Methods:* Seventy patients with cerebral hemorrhage complicated by brain edema were randomly divided into observation and control groups. Both groups had exactly the same number of study participants. There were some differences in specific treatment methods. The specific process is as follows: The control group was treated with mannitol, while the observation group was treated with dual-purpose glycerol fructose. Several important indicators after treatment in the two groups were scored, the effects between different groups were compared, and the effect of clinical treatment was evaluated. *Results:* The final effect was compared and analyzed. After data analysis, we found that the intracranial pressure of the observation group was lower, the volume of brain edema was significantly reduced ($P < 0.05$), and the NIH Stroke Scale/Score (NIHSS) was lower ($P < 0.05$). *Conclusion:* Using mannitol combined with glycerol fructose can achieve better treatment effect by significantly improving the problem of brain edema.

Keywords: Cerebral hemorrhage; Cerebral edema; Clinical treatment; Glycerol fructose; Mannitol; Combination medication

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1. Introduction

In recent years, the incidence rate of clinical cerebral hemorrhage, mainly accompanied by non-traumatic intracerebral parenchymal catheter rupture and hemorrhage, has been increasing. In addition, this condition is associated with high incidence and high mortality and disability rate at the present stage, and the patients with this disease are urged to receive early treatment^[1]. Ordinary patients with cerebral hemorrhage will be accompanied by cerebral edema, and the occurrence of cerebral edema will be increased. High intracranial pressure increases the risk for cerebral hernia, so early reduction of intracranial pressure and dehydration treatment is very essential. Mannitol and glycerol fructose are commonly used in the treatment of cerebral hemorrhage complicated by brain edema. The treatment effect of the combined application of mannitol and glycerol fructose is higher than that of the single drug. Therefore, this study focuses on the observation of the effect of the combined application of the two drugs to evaluate the value and effect of clinical application.

2. Materials and methods

2.1. General information

Seventy cases were selected from the patients treated in our hospital and randomly divided into two groups (each with $n = 35$). The age of the patients ranged from 45 to 78 years, with an average of 67.31 ± 5.34 years. The bleeding sites included basal ganglia, lobe, cerebellum and brainstem. They were not caused by trauma and infarction. The bleeding volume was ≤ 50 ml. They could receive conservative treatment. There were no serious organic diseases, drug allergy, intracranial space occupying lesions and other problems. There were no significant differences in the baseline characteristics between the two groups ($P > 0.05$).

2.2. Methods

First of all, all patients need to receive a series of basic treatments such as conventional anti-coagulation. In addition, in view of the problems of dehydration and intracranial pressure reduction, 20% mannitol needs to be used for infusion. The dosage should be controlled at 250 ml and which was administered once a day. Before infusion, the mannitol dose should be screened for any crystallization caused by low temperature, and it should not be used if crystals had been formed. The mannitol dose can be heated to normal temperature to melt the crystals before rapid infusion. On the other hand, glycerin fructose was indicated in the observation group, and each patient took 250 ml each time, twice a day for one week.

2.3. Observation indexes

In the process of observation, the intracranial pressure, brain edema volume and specific situation of neurological impairment (based on NIH Stroke Scale/Score, NIHSS) of the two groups after treatment were scored and then compared. It was also necessary to make specific measurement with the help of non-invasive intracranial pressure monitor and computed tomography (CT) examination to more accurately determine the size and volume of brain edema. The NIHSS score we used has a range of 0-42 points, including eight indexes of neural function. The higher the score, the more serious it is, and vice versa.

2.4. Statistical methods

SPSS version 20.0 is used for data processing. $P < 0.05$ indicates that the difference is significant and meaningful.

3. Results

After treatment, we found that the intracranial pressure in the observation group was lower, and it was evident from the obvious shrinkage of the volume of brain edema ($P < 0.05$) and lower NIHSS score ($P < 0.05$). The following is the comparison between the two groups. See **Table 1** for details.

Table 1. Comparison of clinical correlation between the two groups after treatment

Group	Number of cases	Intracranial pressure (mmH ₂ O)	Brain edema volume (ml)	NIHSS score
Observation group	35	172.31 ± 20.35	8.35 ± 2.06	7.89 ± 1.25
Control group	35	227.89 ± 21.33	14.32 ± 3.38	13.25 ± 1.67
P	-	<0.05	<0.05	<0.05

4. Conclusions

For patients with cerebral hemorrhage and cerebral edema, in order to avoid the continuous damage of neurological function, appropriate dehydration treatment must be selected. The application of mannitol

combined with glycerol fructose can lead to an improvement of the cerebrospinal fluid circulation that begets more positive effects. An obvious difference was found after relevant treatment. The combination of mannitol and glycerol fructose can further improve the degree of cerebral edema. After the clinical disease treatment and intervention using glycerol fructose, the overall effectiveness of the treatment can also be improved. Other than improving the general effect, the application of the combined treatment further promotes patient's recovery and the improvement of neurological function, improve the problems of intracranial pressure in the early stage, and improve the total effective rate of clinical intervention.

As mentioned above, in the process of clinical treatment of patients with cerebral hemorrhage complicated by cerebral edema, the clinical effect of bed rest combined with mannitol is better than that of single medication and is conducive to the recovery of neurological function of patients.

Disclosure statement

The author declares no conflict of interest.

References

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