Deferoxamine Accelerates Hemorrhage Absorption for Patients With Traumatic Intracerebral Hematoma: A Prospective Randomized Controlled Trial

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Introduction

Traumatic brain injury (TBI) is a common disease for adults, particularly for young people. Most TBI patients have intracerebral hemorrhage, which often to brain edema and toxicity to the neural tissue. Deferoxamine (also known as Deferrioxamine B, Deferoxamine B, DFO-B, DFOA, DFB or desferal,DFX) is a bacterial siderophore produced by the Actinobacteria Streptomyces pilosus. It has medical applications as a chelating agent used to remove excess iron from the body. Animal models indicate Deferoxamine accelerate intracranial hemorrhage absorption, although its effects on human patients remain unclear. In the present study, we investigated whether DFX can accelerate intracranial hemorrhage absorption, reduce acute hemorrhage-induced edema, and improve patient outcome.

Methods

This is a prospective randomized controlled study. Eighty TBI patients with intracranial hemorrhage that does not require surgical evacuation were recruited. Patients were randomized into Group A or Group B. Patients in Group A were administered DFX 500 mg BID for 7 days, while those in Group B received saline as control. The other therapies were conducted following the severe TBI guideline. The volume of hematomas and levels of brain edema were measured by MR. Follow-up visits were conducted for each patients for 6 months using GOS and MMSE as assessment tools.

Results

The period of hemorrhage absorption (reduction of 50%) in Group A was approximately 20% faster than those in Group B ($p<0.05$). The significance of focal edema was also lower in Group A. In the subgroup analysis, patients with subdural hemorrhage and received DFX treatment required 35.7% shorter time of hemorrhage absorption. The 6-month outcomes of patients with DFX treatment were also better than those in Group B. No significant side-effect was observed.

Conclusions

Based on our preliminary study, DFX offers faster hemorrhage absorption, less significant focal edema, and better outcome for patient with traumatic intracerebral hemorrhage. There is a reason to believe that DFX is effective and safe for traumatic Intracerebral hemorrhage treatment, yet further investigation with more patients are required.

Learning Objectives

Participants should be able to: 1) Describe the importance of brain edema in traumatic Intracerebral hemorrhage: 2) Discuss the application of Deferoxamine in traumatic intracerebral hemorrhage.

References

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