

A Study on the Prognostic Value of Thyroid Hormone Levels in Severe Traumatic Brain Injury Patients

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I. Introduction

Traumatic brain injury (TBI) is a major problem which leads to long-term cognitive, behavioral, social and psychological defects. Hypopituitarism in post-traumatic brain injury was described almost one century ago. Pituitary dysfunction is common after TBI in children and adults. The most common cause of TBI is motor vehicle accidents, violence, child abuse, falls and sports injuries. The prevalence of reported hypopituitarism following TBI varies widely among published studies. Prevalence of hypopituitarism ranges from 5 to 90%. The reported prevalence of hypopituitarism after TBI in children and adolescents is similar to the prevalence in adults, but in early childhood, the reported prevalence is lower when compared with adult data. Therefore, this study was designed to find the correlation of FT3, FT4 and TSH levels with the severity and mortality of severe traumatic brain injury patients.

II. Aims And Objectives

To evaluate the effect of thyroid hormones after traumatic brain injury in the severity and mortality.

To gain a clue in brain injury prognosis

III. Material And Methods

100 patients will be selected randomly. All the patients whose GCS ≤ 8 are selected from neurosurgery intensive care unit, detailed history and investigations are done. Free T3, Free T4 and TSH levels are done within 2 hours and 24 hours after admission.

INCLUSION CRITERIA: GCS ≤ 8, Use of mechanical ventilation for 24 hours or more, Age ≤ 60 years.

EXCLUSION CRITERIA: H/O thyroid disease, Evidence of infection, H/O thyroid hormone therapy before, On steroids, amiodarone or Beta blockers.

Detailed history and examination done. Cause of injury and type of injury are included for every patient. Duration of ICU stay, Presence of cerebral edema, loss of consciousness and use of mechanical ventilation are asked. Laboratory investigations like routine, Ct brain, FT3 in 2 hours, FT4 in 2 hours, TSH in 2 hours and FT3, FT4 and TSH after 2 hours are done. Using these values, this study is to find the correlation between FT3, FT4 and TSH values and mean GCS to find the severity of injury. Significance between thyroid hormone values and mortality of these patients are also found. FT3, FT4 and TSH values are done using chemiluminescence assay using MAGLUMI 600 machine. Statistical analysis are done.

IV. Results

In this study, traumatic brain injury is more common in 36 to 45 years (37%) of age. TBI is more common among males (88%). In our study the cause of TBI is road traffic accident (92%) more commonly. Among them Subarachnoid haemorrhage is more common. In our study, cerebral edema, loss of consciousness, and mechanical ventilation and duration of stay in ICU influences the mortality rate. ie. patients with all these features have increased mortality in our study. Among 100 patients, 79 of them were alive and 21 were dead. We found that FT3, FT4 and TSH values in 2 hours of admission were normal.

There was a highly significant correlation between low FT4 and low TSH levels and mortality. There was a correlation between low FT3, FT4 and TSH levels with low mean GCS which signifies severity of patients.

V. Conclusion

This study concluded that low FT4 and low TSH values correlate well with increased mortality of patients. Low FT3 is not associated with increased mortality. Low FT3, FT4 and low TSH values correlate well with decreased GCS on the day of admission, which correlates well with severity. Secondary hypothyroidism is common in traumatic brain injury patients.

Keywords: FT3(Triiodothyronine),FT4(Thyroxine),TSH(Thyroidstimulating hormone).

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