

**TITLE:**

Incidence of Post-Traumatic Growth Hormone Deficiency in Patients with Brain Injury Undergoing Postacute Rehabilitation

**OBJECTIVES:**

1. The participant will understand the incidence and clinical symptoms associated with neuroendocrine dysfunction following brain injury.
2. The participant will understand the limitations of current biomarkers for growth hormone deficiency.
3. The participant will understand how growth hormone deficiency can negatively influence recovery from brain injury.

**STATEMENT OF THE PROBLEM:**

Post-traumatic hypopituitarism is an often undetected consequence of brain injury. Studies estimate the incidence of pituitary dysfunction in patients with brain injury to be 30-68% (Agha, et al 2006; Lieberman et al 2001). Symptoms of post-traumatic hypopituitarism include fatigue, decreased lean body mass, increased abdominal adiposity, exercise intolerance, memory impairments, inability to concentrate, anxiety and depression. These symptoms overlap considerably with deficits commonly observed in patients with brain injury, which may be why a diagnosis of post-traumatic hypopituitarism is often missed following brain injury. Patients with growth hormone deficiency secondary to brain injury have more severe deficits in attention, memory, executive functioning than patients with brain injury alone (Leon-Carrion et al 2007). This indicates that recovery from brain injury may be negatively influenced by concomitant GH deficiency.

Insulin-like growth factor -1 (IGF-1) is considered the best marker of growth hormone activity currently available (Frieda et al 1998). Low levels of IGF-1 increase the likelihood that growth hormone levels are also deficient. However total IGF-1 levels in isolation do not reliably predict GH status in patients who have sustained a brain injury (Aimaretti et al 2005). Approximately,

50% of adults with growth hormone deficiency have IGF-1 levels within the normal reference range (Lissett et al 2003).

The objective of this study was to investigate the incidence of untreated, post-traumatic hypopituitarism, specifically growth hormone deficiency, in patients admitted to a postacute, residential brain injury facility. Preliminary results indicate that over 50% of patients had at least one undiagnosed hormone deficiency. Results also indicate that IGF-1 level was not a good biomarker of growth hormone deficiency. This session will discuss the importance of provocative testing to diagnose growth hormone deficiency, as well as, monitoring clinical symptoms of growth hormone deficiency. Additionally, the influence of growth hormone deficiency on functional outcomes such as Disability Rating Scale (DRS) status and scores on the Independent Living Scale (ILS) will be discussed.

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