

Traumatic Brain Injury and Endocrine Dysfunction:

An Underdiagnosed Condition

By Brett Carter, Esq.

Traumatic brain injury (TBI) occurs when an external mechanical force causes brain dysfunction. TBI usually results from a violent blow or jolt to the head or body. Injury may include one or more of the following factors:

- Damage to brain cells may be limited to the area directly below the point of impact on the skull.
- A severe blow or jolt can cause multiple points of damage because the brain may move back and forth in the skull.
- A severe rotational or spinning jolt can cause the tearing of cellular structures.

Those attorneys handling premises liability cases should note that falls and car wrecks are the most common events causing TBI. Personal injury attorneys need to ensure their clients accurately communicate their symptoms and obtain proper medical evaluation of potential brain injuries so that proper treatment can be initiated.

Typical symptoms to be mindful of include the following: loss of consciousness for a few seconds to a few minutes; no loss of consciousness but a state of being dazed, confused or disoriented; headache; nausea or vomiting; sensory problems such as blurred vision, light sensitivity, ringing in the ears, and changes to taste or smell; fatigue or drowsiness; difficulty sleeping; sleeping more than usual; cognitive and intellectual problems; mental health problems

like depression, anxiety, and behavioral and personality changes; language and communication difficulties; social problems; and dizziness or loss of balance. However, the complications of TBI are not restricted to neurological consequences¹. Gastrointestinal, genitourinary, cardiovascular and endocrinological complications commonly occur.

As a result of damage to the brain's pituitary gland, there exists a high incidence of major hormonal dysfunction following TBI, contributing to a delayed or hampered recovery for many. Symptomatic patients with mild, moderate or severe TBI are at risk for hypopituitarism (i.e., a condition in which the body lacks sufficient thyroid hormone) and should be offered neuroendocrine testing². In a systematic review of 14 studies reporting data on 1,014 patients, the prevalence of hypothyroidism was 35.3, 10.9 and 16.8% in patients with severe, moderate, and mild TBI, respectively. A more recent published systematic review of 66 studies (5,386 adult patients) demonstrated these hormone deficiencies failed to abate and, instead, persisted in approximately 30% of cases. Negative imaging (e.g., CT, MRI) does not exclude the disorder³.

Key hypothyroidism symptoms include depression and fatigue, while other common symptoms are joint pain and unexplained weight gain⁴. However, the symptoms and signs of hypopituitarism are not unique to pituitary dysfunction caused by TBI. Patients with hypoadrenalism may also present with fatigue, dizziness and joint aches several months or weeks after a TBI. Abnormally low cortisol responses may not show up on

continued p.27

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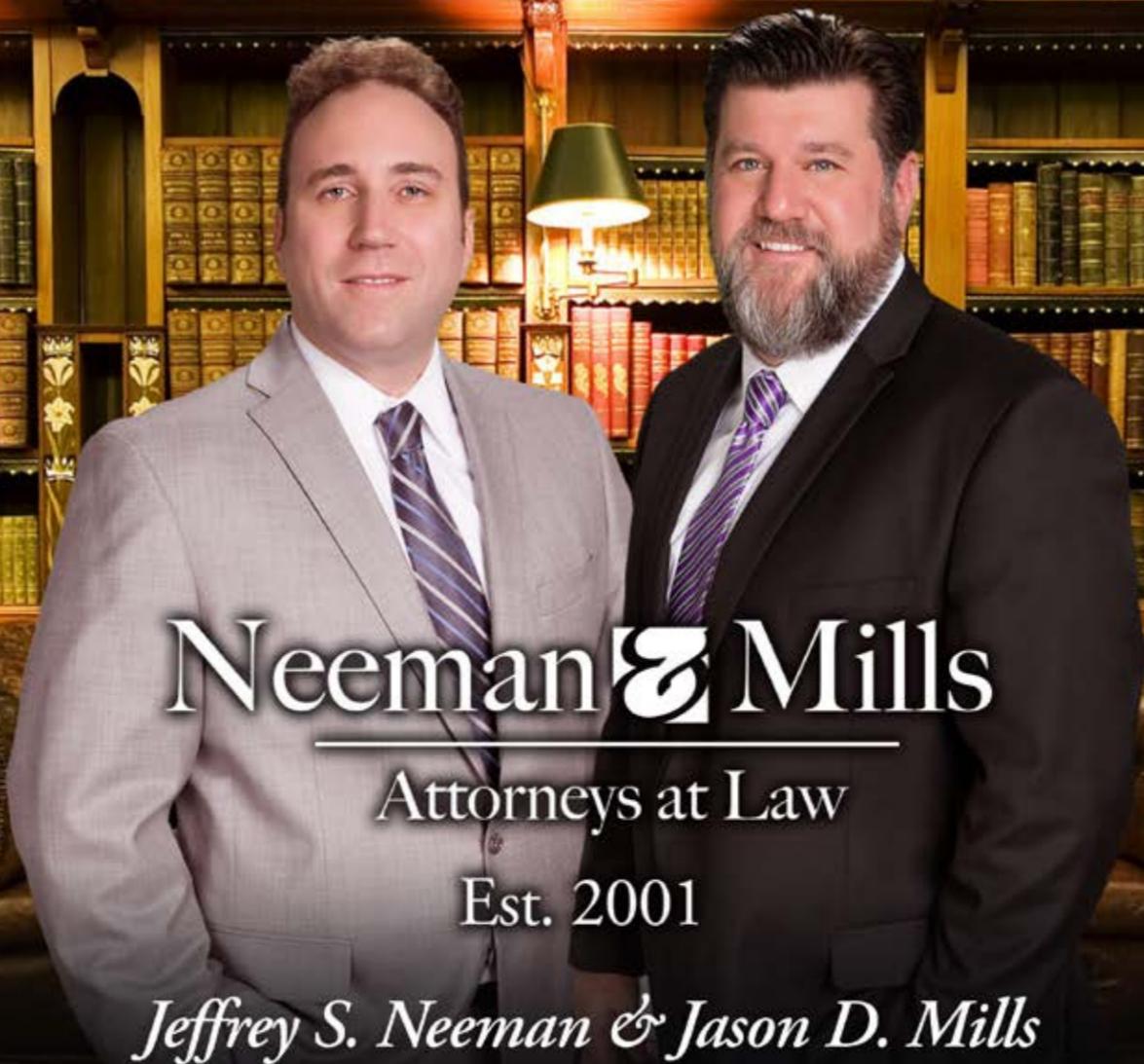


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testing during those first few months. A dysfunctional adrenal system (hyper or hypo) can result in a potentially deadly adrenal crisis, requiring hospitalization.

TBI can result in suppression of gonadal function, dropping Testosterone levels. Hormonal replacement may be necessary, but doing so carries other health concerns.

Damage to the pituitary gland may also affect human growth hormone (GH) and serum insulin-like growth factor 1 (IGF-1) levels. Adult patients with GH deficiency may report impaired stamina and quality of life, ability to repair muscle, increased body fat, anxiety and depression, decreased sexual function and interest, and low bone mass⁵.

A substantial body of evidence suggests that TBI-induced hypopituitarism is not uncommon and is associated with increased morbidity and mortality. Though patients with moderate and severe TBI are at a greater risk, clients with mild or repetitive TBI may also develop pituitary hormone deficiencies. The medical literature recommends a thorough, systematic evaluation of pituitary function in patients with all classes of TBI severity. The goal is to detect and replace pituitary hormone deficiencies to improve outcomes.

The potential devastating consequences of brain injury necessitate prompt recognition and intervention where appropriate, if, for no other reason, to increase the odds for a more favorable quality of life. Underdiagnosed conditions, such as endocrine dysfunctions following TBI, can frustrate recovery. Educating ourselves through medical research to include the causation and pathophysiology of various conditions allows us to best assist our clients by proper recognition, proving their injuries, helping them obtain the very best medical care, and ultimately attempting to compensate them for what has been lost and can't be replaced.

Endnotes

¹ Bondanelli M, Ambrosio MR, Zatalli MC, et al. Hypopituitarism after Traumatic Brain Injury. *European Journal of Endocrinology*. 2005; 152:679-691.

² Tritos NA, Yuen KCJ, Kelly DF, et al. American Association of Clinical Endocrinologists and American College of Endocrinology Disease State Clinical Review: A Neuroendocrine Approach to Patients with Traumatic Brain Injury. *Endocr Pract*. 2015; 21(No. 7):823-831.

³ Krahulik D, Zapletalova J, Frysak Z, et al. Dysfunction of Hypothalamic-Hypophysial Axis after Traumatic Brain Injury in Adults. *J Neurosurg*. Sept. 2010; Vol 113: 581-584.

⁴ Hypothyroidism Slideshow - Causes, Symptoms, and Treatments for Hypothyroidism. *Endocrineweb.com*.

⁵ Human Growth Hormone Deficiency. *Cedars-Sinai.edu*.

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