

# Could cerebrospinal fluid leaks be a link between traumatic brain injury and dementia?

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Cerebrospinal fluid (CSF) leaks may be one of the mechanisms that link traumatic brain injury (TBI) with dementia, according to a hypothesis in

*Alzheimer's & Dementia: Translational Research & Clinical Interventions,*

Traumatic brain injuries are strongly associated with an increased risk of dementia. Unfortunately, the exact pathways underlying this relationship are unclear. This gap in knowledge makes it difficult to create preventative strategies to support patients with TBI.

CSF leaks are associated with decreased brain buoyancy and the appearance of brain sagging on MRI. Severe brain sagging may cause symptoms that mimic those of a behavioral variant of frontotemporal dementia (bvFTD), a type of early-onset dementia.

A recent publication by Schievink and colleagues found that a type of spinal CSF leak called CSF-venous fistula is common among patients with symptoms of bvFTD. Once identified through a specialized imaging technique known as digital subtraction myelography, surgical correction of the leak resulted in resolution of the dementia symptoms among all nine eligible patients in the study who had frontotemporal brain sagging syndrome.

"When I read Schievink et al's study, a light went off in my head," says senior author Professor Esme Fuller-Thomson, "I wondered if these CSF leaks could be an important contributing factor in the well-established link between traumatic brain injury and dementia. The reason that this is so exciting is that if this hypothesis is true, it is possible that treating the [leak](#) may mitigate dementia symptoms in some patients with a history of TBI."

Dr. Fuller-Thomson is the director of University of Toronto's Institute of Life Course and Aging and a Professor in the Factor-Inwentash Faculty of Social Work and Department of Family and Community Medicine.

CSF leaks are identified in around 1–3% of adults with a [traumatic brain injury](#). Symptoms of severe CSF leaks include headache, disequilibrium, and hypersomnolence. While many CSF leaks may resolve on their own, larger leaks may require surgical ligation through a minimally invasive procedure.

Identifying the source of CSF leaks can be difficult, but specialized imaging modalities, such as the digital subtraction myelography used by Schievink, may be helpful.

"We hope that other researchers are equally intrigued by the potential importance of CSF [leaks](#) in the association between TBI and [dementia](#) and that further research exploring this association will be conducted," says co-author Judy Deng, a pharmacist from the University of Toronto.

Fuller-Thomson adds, "This hypothesis is, of course, high speculative and we need much more research to determine if it holds any promise."

**More information:** ZhiDi Deng et al, Could cerebrospinal fluid leak contribute to the link between traumatic brain injury and dementia?, *Alzheimer's & Dementia: Translational Research & Clinical Interventions* (2023). [DOI: 10.1002/trc2.12419](https://doi.org/10.1002/trc2.12419)

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