

Clustering method can better describe the pathological process in patients with traumatic brain injury

November 14 2023



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Monitoring brain injury biomarkers and glucose variation in patients who have suffered an acute cranial injury during the entire first week of hospitalization can provide a more accurate picture of the pathological process. This is according to [a paper](#) published in *The Lancet Neurology* by researchers at Karolinska Institutet in Sweden. It is hoped that their findings can eventually lead to more personalized treatment.

After samples of [brain injury](#) markers and glucose have been taken over the entire first week of intensive care, patients with [traumatic brain injury](#) can be divided into different groups with different disease trajectories and prognoses.

"This could one day be used to identify different therapies for these different groups, who currently receive effectively the same treatment," says the study's first author Cecilia Åkerlund, anesthetist and intensive care specialist at Karolinska University Hospital in Solna and researcher at the Department of Physiology and Pharmacology, Karolinska Institutet, Sweden.

She shows in her study that an advanced clustering method can be used to divide patients into six groups by sample data. In the group with the best prognosis, only 4% died after six months, as opposed to a full 65% in the group with the worst prognosis after the same time—41% during the first week.

Many hospitals now use a model based on different factors from the patients' day of admission to assess their prognoses.

"Our study shows that more information gathered over a longer time might be needed to assess the patients," she says.

The variation between the highest and lowest glucose variation during the day was one of the key metrics used to characterize the patients,

something to which little attention is paid today. The same is true of the relevant biomarkers, which are also generally ignored during the first week of admission. Karolinska University Hospital, however, is an exception:

"We clinically monitor certain brain injury biomarkers daily," says Dr. Åkerlund. "But we are one of few hospitals in the world to do so, as far as I'm aware."

"Our study supports the notion that serial brain injury biomarkers can play an important part in monitoring the disease trajectory in our brain injury patients," says the study's last author David Nelson, consultant at Karolinska University Hospital's neurocritical care unit and researcher at Karolinska Institutet.

At the same time, Dr. Åkerlund acknowledges that more research is needed on both the biomarkers and the patient groupings before the method can be recommended on a broad front.

"These results need to be corroborated by larger studies and with other patient groups to show that the method is stable," she says. "If we can do this, it will be an important step towards being better able to personalize the treatment of [patients](#) with primarily moderate and severe traumatic brain injuries."

More information: Cecilia A.I. Åkerlund et al, Clinical descriptors of disease trajectories in patients with traumatic brain injury in the intensive care unit (CENTER-TBI): a multicentre observational cohort study, *The Lancet Neurology* (2023). [DOI: 10.1016/S1474-4422\(23\)00358-7](#) , [www.thelancet.com/journals/lan ... \(23\)00358-7/fulltext](#)

Provided by Karolinska Institutet

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