



BRAIN INJURY IN INTIMATE PARTNER VIOLENCE

Despite being declared a national emergency in 2014, intimate partner violence (IPV) remains a major health and welfare concern. Physical attacks during IPV often target the head and neck. Consequently, concussion is one of the most significant health consequences faced by IPV survivors.

- Although common across all genders, IPV predominantly affects women, with 1 in 4 Australian women experiencing IPV
- IPV is the leading cause of preventable death, disability, and illness in Australian women aged 15-44, and
- Violence against women and their children has an annual economic cost of AUD \$22 billion.

What is unique about concussions in IPV is that they frequently occur alongside strangulation, potentially worsening the brain injury. The violence can also be highly repetitive causing further damage. A diagnosis and detection of concussion often relies on self- or witness-report of the incident. This isn't always possible for patients because of 1) fear, 2) not being able to remember the attack as they have lost their memory, and 3) the only potential witness is the perpetrator. However, it is critical to identify IPV-related brain injuries early for proper support and treatment, and so more severe consequences, such as death, are prevented.

WHAT DID THE RESEARCHERS FIND?

We examined symptoms and biomarkers in IPV patients who had experienced a concussion within the past 72 hours as an objective method using a blood sample. Many of these patients had experienced strangulation at the same time as the concussion. We found that the IPV concussion patients had higher levels of neurofilament light (a marker of injury to the axon of a brain cell) in their blood. Patients reported a greater severity in their brain injury symptoms compared to healthy individuals and patients who had experienced a concussion that was not due to IPV.

Because the clinical setting of IPV is so complex we also created a rat model of non-fatal strangulation. We investigated the effects of strangulation and concussion, both separately and together. We found when rats experienced both injuries at the same time, they had more significant motor and cognitive issues, increased inflammation and injury in the brain, and higher levels of certain brain injury markers in their blood.

WHAT DO THESE FINDINGS MEAN? HOW CAN YOU USE THIS RESEARCH?

These findings suggest that –

- Blood biomarkers may be a useful method to help detect brain injury in IPV patients, and
- Strangulation can worsen the effects of concussion.

Our results provide important insights for clinicians to use to inform care and management of IPV patients. They also provide a foundation for future research to improve detection and treatment of brain injuries due to IPV.

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For more information visit the [Monash Trauma Group](#) webpage

Source - Mujun Sun, Georgia F. Symons, Gershon Spitz,, Sandy R. Shultz. Pathophysiology, blood biomarkers, and functional deficits after intimate partner violence-related brain injury: Insights from emergency department patients and a new rat model. *Brain, Behavior, and Immunity*, 2024, <https://doi.org/10.1016/j.bbi.2024.09.030>

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