

# Brain autopsies of female intimate partner violence victims reveal different injuries from male contact sports athletes

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The largest brain autopsy study to date of women who had experienced intimate partner violence reveals substantial vascular and white matter

damage in the brain, but no evidence of chronic traumatic encephalopathy (CTE), the neurodegenerative disease recognized among male contact sports athletes who sustain repeated head trauma.

The [international collaboration](#), led by a team from the Brain Injury Research Center of Mount Sinai in collaboration with the New York City Office of the Chief Medical Examiner, appears in the most recent issue of [Acta Neuropathologica](#).

Importantly, the study also revealed substantial medical comorbidity, including cardiovascular and cerebrovascular disease, suggesting a need to consider a broad scope of pathology that underlies intimate partner violence-related [brain](#) injury, as well as the medical and psychiatric comorbidities that contribute to brain health during life.

Despite how common intimate partner violence is—it affects one in three women at some point in their lives—remarkably little is known about the neuropathology of partner violence. The long-term consequences of traumatic brain injury include the risk of neurodegenerative disease, and in the popular press and even in scientific discussions, there is an assumption that repeated [head injuries](#) sustained in the context of intimate partner violence are comparable to those sustained by male contact sports athletes.

"Because our team has been conducting research and [clinical care](#) with survivors of partner violence for years, we strongly suspected that the neuropathology of brain injury may be far more complex than assumed," said Kristen Dams-O'Connor, Ph.D., Director of the Brain Injury Research Center of Mount Sinai and lead author of the paper. "Through our unique collaboration with the Office of the Chief Medical Examiner here in New York and international colleagues, we were able to shed light on this group that has been nearly absent from the medical literature."

The collaboration between the Brain Injury Research Center and the Office of the Chief Medical Examiner dates from 2019, when the two entities solidified an unprecedented academic collaboration with the shared goal of identifying decedents with a history of traumatic brain injury for inclusion in the Late Effects of TBI (LETBI) brain donor program.

The clinical research team invited families of the decedents to participate in an interview so the team could learn more about the deceased's health, brain trauma history, and any symptoms of clinical decline the relatives may have observed during life. The postmortem protocol of the LETBI study includes ex vivo imaging, in which the whole brain specimen is scanned at high resolution. This allows researchers to identify lesions that are invisible to the human eye and that would be missed in a standard brain autopsy, permitting an examination of unparalleled comprehensiveness.

For the prospective case series, 14 brains were obtained over two years from women with documented intimate partner violence (ages 20s-late 70s; median, 30s) and complex histories, including prior traumatic brain injury; nonfatal strangulation; cerebrovascular, neurological, and/or psychiatric conditions; and epilepsy. At autopsy, all had old and/or recent traumatic brain injury stigmata (physical marks seen in the brain that are characteristic of the condition). Substantial vascular and white matter pathology was seen in some.

Evidence was found of [cerebrovascular disease](#) from lacunes (small cystic cavities in the brain that usually result from an ischemic infarction and much more rarely from a small, deep cerebral hemorrhage) and/or from chronic infarcts (localized areas of dead tissue resulting from failure of blood supply). Alzheimer's disease neuropathologic change was present only in the oldest case in the series (in the 70-79 age range), and no CTE neuropathologic change was identified in any.

Findings from the initial prospective case series prompted similar exploration of an expanded case series of 70 archival intimate partner violence cases (ages late teen to late 80s; median 30s) accrued from multiple international institutions. In this archival series, the research team again found evidence of vascular and white matter pathologies. Only limited neurodegenerative proteinopathies were encountered in the oldest subjects, with none meeting the consensus criteria for CTE neuropathologic change.

"We were astounded by the burden of health comorbidity carried by the women in this series. Approximately half had epilepsy, and chronic diseases such as diabetes, hypertension, substance use, and HIV were common," said Dr. Dams-O'Connor. "The findings clearly indicate that we should be casting a much wider net when it comes to characterizing the neuropathology of partner violence-related brain injury and post-traumatic neurodegeneration."

"The consequences for intimate partner violence are enormous both on an individual and societal level, and it's more common than most people realize," she added. "Our research suggests that it is a frequently unmeasured and under-recognized contributor to the brain health decline experienced by many survivors."

Rebecca Folkerth, MD, Neuropathologist at the New York City Office of the Chief Medical Examiner, Clinical Professor of Forensic Medicine at NYU Grossman School of Medicine, and senior author of the paper, emphasizes that "without close collaboration between forensic centers, where [violent deaths](#) are analyzed for medico-legal purposes, and clinical research collaborators such as those at the Brain Injury Research Center of Mount Sinai, advances in the field of intimate partner violence will remain highly constrained.

"The only way toward understanding the associated brain injuries at a

cellular level is through coordinated, intensive examination directly in the brains of affected individuals. We are so grateful for this initial opportunity, and hope to expand it while using and sharing what we have learned."

The researchers advise anyone who encounters someone with a history of intimate partner violence to be aware that the individual may have neurological injury that affects their brain health and function. The work of researchers and clinicians at Mount Sinai's Brain Injury Research Center has consistently demonstrated that people living with brain injury may not be able to benefit from standard interventions that are not tailored to address their deficits. They may require different accommodations, more reminders, and more support to benefit from available assistance.

"If someone with a brain injury misses an appointment, it may not be because they're ungrateful for the help or they don't care about the service being offered. If they lose their temper, it may be a manifestation of neurobehavioral dysregulation attributable to the traumatic brain injury. If they remain in a violent relationship, it may be that they don't have the cognitive and executive function skills, or resources, required to orchestrate a safe and successful path to safety," explained Dr. Dams-O'Connor. "This is not something the survivor should be blamed for."

The results of this case series represent an unprecedented advancement in the understanding of partner violence-related brain injury, and the investigators believe there is a message of hope in their findings. Vascular contributors to [cognitive impairment](#) and decline may be treatable in some cases. Given the high burden of vascular brain injury, together with the extensive disease comorbidity observed in this cohort, it is possible that some symptoms experienced by people living with partner violence-related brain [injury](#) may be treatable, or even preventable.

Domestic violence often goes unreported, and survivors may struggle to access even basic health care. Systematic screening for [intimate partner violence](#) can connect survivors to available resources—and possibly could have even saved the lives of the young women in this study.

**More information:** Kristen Dams-O'Connor et al, The neuropathology of intimate partner violence, *Acta Neuropathologica* (2023). [DOI: 10.1007/s00401-023-02646-1](#)

Provided by The Mount Sinai Hospital

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