



Defense Health Agency

Defense and Veterans Brain Injury Center
“Clinical Updates in Brain Injury Science Today [CUBIST]” Podcast
“Suicide and TBI among Veterans Seeking VA Health Care”

TRT: 10:58 min

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Betsy Myhre: The views, opinions, and findings contained in this podcast are those of the host and subject matter experts. They should not be construed as official Department of Defense positions, policies, or decisions unless designated by other official documentation.

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Myhre: Welcome to Clinical Updates in Brain Injury Science Today, or “CUBIST,” a podcast for health care providers about current research on traumatic brain injury, also known as TBI. This program is produced by the Defense and Veterans Brain Injury Center, otherwise known as DVBIC. I'm your host today, Betsy Myhre. I'm a nurse practitioner here at DVBIC.

In the first episode of the third season of CUBIST, I'll be talking with Dr. Donald Marion. Dr. Marion is a neurosurgeon at DVBIC. Don and I will discuss a study entitled: “Suicide and Traumatic Brain Injury Among Individuals Seeking Veterans Health Administration Services Between Fiscal Years 2006 and 2015,” by Trisha Hostetter and colleagues, and published in [the Journal of Head Trauma and Rehabilitation](#), September 2019. As a reminder, if you're in crisis or are concerned about a service member or veteran in your life, get help now. The Veterans' Crisis Line staffs qualified responders waiting to help 24 hours a day, seven days a week. Call 1-800-273-8255 and press 1 or visit www.veteranscrisisline.net, that's veterans' crisis line dot net.

Myhre: Hi Don, thanks for bringing this great article to our attention today. Can you tell me what were the key findings of this study?

Marion: Sure, in a very large study of a Veterans Administration health care database, a history of traumatic brain injuries, or TBI, was found to increase the risk for suicide and other psychiatric conditions by more than two-fold. Specifically, the rate of suicide was 86 per 100,000 person years for those with TBI, compared with 37 per 100,000 person years for those without a history of TBI. Veterans with a history of TBI also had a two-to-four times higher prevalence of psychiatric diagnoses compared with those who did not suffer a TBI, with PTSD being the most common. The prevalence of depression in the mTBI group was 68.1 percent. The group was 93 percent male, and the median age was 56 years. The incidence of suicide among the seven percent of women in the cohort was less than half that of the men. Only 9.7 percent of the cohort had a moderate/severe TBI, but the risk of suicide was highest in that group. And finally, the most common mechanism of suicide was firearms at 68 percent.

Myhre: Ok, so, this was a big database that they reviewed, can you tell us exactly how they did that?

Marion: So, it was a retrospective cohort study of individuals who used the Veterans Healthcare System (VHS), and it included both inpatients and outpatients, between October of 2005 and September of 2015. It was done by reviewing

the Veterans Administration (VA) Electronic Medical Record or the EMR. Veterans must have had at least two visits a minimum of 90 days apart to be included. Those who had a history of neurodegenerative diseases known to be associated with suicide were excluded. A history of TBI was identified by ICD-9 codes, and a total of 215,610 eligible veterans with a history of TBI were identified. A random sample of 1,187,639 veterans without TBI codes in their Electronic Medical Record were selected for comparison. A history of psychiatric conditions, prior to or during the study timeframe, were also captured using ICD-9 diagnostic codes and included depression or other mood disorders, bipolar disorder, psychotic disorder, posttraumatic stress disorder (PTSD), anxiety disorder, and substance use disorder.

Death by suicide was captured using data from the VA Department of Defense Suicide Data Repository, which contains all-cause mortality data from the National Death Index (NDI). The NDI is considered the gold standard for capturing cause and date of death. For analyses examining suicide method, two mutually exclusive suicide outcomes were considered, so this was a dichotomized analysis. In the one arm, suicide by firearms was reported, and the second arm included suicide by other means such as by hanging, self-poisoning, or drowning. Cox Proportional Hazards modeling was then used to estimate hazards ratios, and models were run to adjust for age, gender, psychiatric conditions, comorbidities and other chronic conditions.

Myhre: Thanks Don. Was there any information about pre-morbid suicide risk?

Marion: That's a great question Betsy. Suicide was more common among those veterans with depression, bipolar disorder, substance use disorder, and anxiety disorder. But it would also have been helpful to know about suicidal intent and previous attempts. For example, what proportion disclosed their suicidal intent to others, and what proportion had a history of previous suicide attempts. Also, it is known that alcohol use immediately prior to the incident, criminal legal problems, and financial or job problems are risk factors for suicide, but because of the methods used to conduct this study, none of this information is available.

Myhre: Ok, I think it also would have been interesting to know if the veterans had retired from the military or if they had been voluntarily or involuntarily released from active duty, or if they had been medically separated or retired. So, how do these suicide numbers compare with the non-veteran general public?

Marion: According to CDC statistics from 2017, the incidence of suicides among men between the ages of 45-64 was 30.1 per 100,000 and I selected that age group because the mean age in this veteran population was in their mid-50s.

Myhre: Ok, so you just described the incidence here as "per 100,000" but for the VA study you used the term "per 100,000 person years." Can you tell our listeners a little bit about the difference between those two categories?

Marion: Sure Betsy. When investigators are looking at the incidence of a disease in a defined cohort over a specified number of years, it is appropriate to use the term "person years." But if the question is just what 'is the incidence now,' then "person years" is not used. If the populations are reasonably similar, both statistics are comparable.

Myhre: Alright, so, one of the other things that you talked about was that the investigators also analyzed the method of suicide, the firearm compared to other types of suicide. Can you speak a little bit more about the outcome of that?

Marion: Sure, they dichotomized this analyses, as I said before, to firearms versus all other means of suicide such as hanging, self-poisoning or drowning. Firearms were the method of suicide in 68 percent of the group as a whole. However, in those with a history of moderate/severe TBI, firearms were used by 78 percent. Looked at in another way, the odds of suicide by firearms in veterans with a history of moderate or severe TBI were 2.39 times the odds of suicide by firearm for those without a TBI.

Myhre: Alright, so what were the limitations of this study?

Marion: Probably, one of the main ones was that only seven percent of the TBI cohort in this study were women, so I think it may be inappropriate to assume that the findings of the study apply to women. As I mentioned before, there is

unfortunately no information about suicide attempts, substance use prior to the act, or financial/job status, all of which could have helped providers effectively intervene.

Myhre: What are the key take-a-ways from this study?

Marion: So I think the most important thing that I took from the study, Betsy, was that a history of TBI appears to increase the risk of suicide among veterans. While the risk for veterans with no history of TBI is close to a similarly aged non-veteran U.S. population of men, that is 37 per 100,000 person years vs 30.1 per 100,000, respectively. It is about twice as common in veteran men with a history of TBI. The findings of this study emphasize the need for providers of VA health care to attempt to identify any history of TBI, and to include lethal means safety into their homes or rehabilitation settings. However, it should also be emphasized that the incidence of suicide even among veterans with a history of TBI, at 86 per 100,000, is still less than 0.1 percent.

Myhre: That's a really great point, thanks for emphasizing that Don. I would also say, as a primary care manager, for me you know, just asking your veterans and being aware of people that have had a history of TBI, especially moderate-severe, may be at increased risk for suicide. So just questioning, "Do you have access to a firearm in your home and how do you secure that firearm in your home?"

Marion: That's a great point. And I would say too, based on my previous practice, it's often not an obvious question that you would ask about a history of TBI especially in a 50- or 60-year old veteran that comes into your clinic. You may be more focused on their hypertension or their diabetes. This points out that it's really important to ask.

Myhre: Sure. In your annual screening to ask those questions. Additional information on patients at risk for suicide is available in the 2019 VA DoD Clinical Practice Guidelines for the Assessment and Management of Patients at Risk for Suicide. This can be found on the VA website at [Healthquality.VA.gov](https://www.healthquality.va.gov).

This has been a really great article. Thanks so much for highlighting it. That's all we have time for today. We hoped you enjoyed this quick literature update. You can stay up-to-date on future episodes by subscribing to "CUBIST" on iTunes, Sound Cloud, Stitcher, or wherever you listen to podcasts, where you can also find links to the articles we discuss and other relevant resources.

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"CUBIST" is produced and edited by Vinnie White and was hosted today by me, Betsy Myhre. It is a product of the Defense and Veterans Brain Injury Center, led by Division Chief Captain Scott Pyne, Medical Corps, U.S. Navy.

Thank you for listening to this episode. Next time, we will discuss TBI research getting attention in the mainstream press.

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