Over half of the 100,000 lower extremity amputations in the United States every year are related to complications of diabetes mellitus, yet depression and mental health are not routinely addressed as an underlying contributor. As healthcare continues to shift in the United States to more population-specific and customized preventive measures, it is unknown if threatened limb and other wound classification systems as well. The Veteran population has unique comorbid, socioeconomic, and psychosocial challenges, including mental health issues secondary to traumatic experiences. In this study, we aim to determine associations between a diagnosis of depression and the PAVE FRS among the Veteran population. Secondly, we aim to produce a Veteran-specific DFU classification system for this population. We hypothesize that Veterans with a PAVE FRS 2 and PAVE FRS 3 will have greater odds of a diagnosis of depression compared to the PAVE FRS 0. Further, we hypothesize that there will be no significant difference between PAVE FRS 2 and PAVE FRS 3 Veterans in terms of the prevalence of depression.

Diabetic Foot Complications and Depression

The causes of diabetic foot ulcers in veterans are multifactorial and preventable ranging from poor diet, lack of exercise, and depression. Depression is associated with poor wound healing outcomes such as emotional eating, poor diet, lack of compliance, self-isolation and substance abuse. The diabetic foot-pain-depression cycle first proposed by Brooks et al to described an underlying causal mechanism between depression, pain, and diabetic foot complications (Figure 1.1). The causes of diabetic foot ulcers in veterans are multifactorial and preventable ranging from poor diet, lack of exercise, and depression. Depression is associated with poor wound healing outcomes such as emotional eating, poor diet, lack of compliance, self-isolation and substance abuse. The diabetic foot-pain-depression cycle first proposed by Brooks et al. to describe an underlying causal mechanism between depression, pain, and diabetic foot complications (Figure 1.1). Our hypothesis is that between PAVE FRS 2 and PAVE FRS 3 Veterans in terms of the prevalence of depression.

Descriptive Results

- 148 Veterans met the inclusion criteria.
- 28 veterans were classified as PAVE FRS 0, 52 were classified as PAVE FRS 1, 51 as PAVE FRS 2, and 17 FRS as PAVE FRS 3.
- The diagnosis of depression was broken down by PAVE FRS in Figure 2.

Univariate Analysis

- Only PAVE FRS 2 and PAVE FRS 3 were statically significant in the univariate analysis.

Multivariate Logistic Regression Model

- The pseudo R-square was 0.0906.
- PAVE FRS 0 = normal risk. PAVE FRS 1 = deformity. PAVE FRS 2 = decreased sensation, no severe peripheral arterial disease, no ulceration, and no CKD or less than CKD stage 4. PAVE FRS 3 = history of DFU, amputation, severe peripheral arterial disease, Charcot with lasting foot deformity, or CKD stage 4.

Diabetic Foot Pain and Depression Cycle

Figure 1: The Diabetic Foot- Pain – Depression Cycle

- The diabetic foot-pain-depression cycle first proposed by Brooks et al. to describe an underlying causal mechanism between depression, pain, and diabetic foot complications (Figure 1.1).

Figure 3: Depression diagnosis (blue) by PAVE FRS

Figure 2: The Four Pillars of Multidisciplinary Amputation Prevention in WIVF/D

Discussion

- The WHOD acknowledged depression as a leading cause of global disease burden affecting 280 million people and costing $326.7 billion in 2018 in adults alone.3 Recommended treatment plans for depression should include a comprehensive approach utilizing psychotherapy, pharmacotherapy, and tailored management for comorbidities.1 Early recognition and appropriate referral is imperative.

- Depression has been documented to be associated with noncompliance, self-isolation, failure to keep appointments and hopelessness, all associations that pose significant threats to healing.

- In this retrospective cohort study of 148 Veterans, depression was highly prevalent (30-80% depending on FRS). Further, it is known that both deployment and combat are associated with increased risk of depression.4

- Current wound care and threatened limb classification systems do not account for diagnosis or overall mental health.

- We proposed a modification to the Society for Vascular Surgery’s Wound, Ischemia, Foot Infection (Thromb) Limb Classification System to include depression (Figure 3).

- We recommend podiatrists use Patient Health Questionnaire-9 (PHQ-9), a nine-question instrument to screen for depression and make appropriate referrals to mental health clinicians (i.e., psychiatrists, clinical psychologists).

Conclusions

- Depression is prevalent in the Veteran population; Veterans with a PAVE FRS of 2 or 3 had greater odds of having a diagnosis of depression compared to veterans with a PAVE FRS of 0.

- There was no significant difference in prevalence of depression in PAVE FRS 2 (no DFU or amputation) and PAVE FRS 3 (DFU or amputation).

- Given that depression is associated with noncompliance, self-isolation, failure to keep appointments and hopelessness, all associations that pose significant threats to healing, we recommend that psychiatrists and other mental health clinicians be included on multidisciplinary limb salvage teams.

- We propose a modified WIfI classification system to help both veterans and clinicians overcome the schema associated with routine depression screening.

References


