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ORIGINAL RESEARCH

Suicidal Ideation Among Individuals With Dysvascular Lower Extremity Amputation

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Abstract

Objective: To examine the estimated prevalence and correlates of suicidal ideation (SI) among individuals 1 year after a first lower extremity amputation (LEA).

Design: Cohort survey.

Setting: Four medical centers.

Participants: A referred sample of patients (N=239), primarily men, undergoing their first LEA because of complications of diabetes mellitus or peripheral arterial disease, were screened for participation between 2005 and 2008. Of these patients, 136 (57%) met study criteria and 87 (64%) enrolled; 70 (80.5%) of the enrolled patients had complete data regarding SI at 12-month follow-up.

Interventions: Not applicable.

Main Outcome Measures: SI, demographic/health information, depressive symptoms, mobility, independence in activities of daily living (ADL), satisfaction with mobility and ADL, medical comorbidities, social support, self-efficacy.

Results: At 12 months postamputation, 11 subjects (15.71%) reported SI; of these, 3 (27.3%) screened negative for depression. Lower mobility, lower satisfaction with mobility, greater impairment in ADL, lower satisfaction with ADL, lower self-efficacy, and depressive symptoms were all correlated with the presence of SI at a univariate level; of these, only depressive symptoms remained significantly associated with SI in a multivariable model.

Conclusions: SI was common among those with recent LEA. Several aspects of an amputee's clinical presentation, such as physical functioning, satisfaction with functioning, and self-efficacy, were associated with SI, although depression severity was the best risk marker. A subset of the sample endorsed SI in the absence of a positive depression screen. Brief screening for depression that includes assessment of SI is recommended. Archives of Physical Medicine and Rehabilitation 2015;96:1404-10

Amputation is a relatively common procedure. An estimated 185,000 individuals in the United States undergo an upper or lower limb amputation each year.[1] Recent studies suggest that 1.6 million individuals in the United States are living with an amputation, an estimate that is expected to double in the next 50 years.[2]

Although prevalence estimates vary, research suggests that individuals with an amputation are at increased risk of developing clinically significant depressive symptoms. Although there is some variability in how depressive symptoms are measured and how depression is defined, prevalence rates typically range from 25% to upwards of 50%,[3-6] which are comparable to the rates of depression reported among individuals with chronic illness or disability.[7-9] Rates of depression appear highest during the first 2 years after amputation, declining thereafter to approximately those seen in the general population,[5] which is estimated to be roughly 5% to 6%.[10,11]

Suicidal ideation (SI) is a symptom of major depressive disorder (MDD) as well as other depressive disorders (eg, dysthymia, minor depression).[12,13] A community cohort study[14] observed that

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16.9% of individuals diagnosed with clinically significant depressive symptoms (ie, endorsing at least 2 symptoms of MDD, 1 of which was anhedonia or depressed mood) reported experiencing SI over a 2-year period. Estimates indicate that among individuals with MDD, 15.9% will attempt suicide at least once in their lifetime.[15] Because depressive disorders occur at an elevated rate among individuals with amputation (particularly in the first 2 years after amputation), this may be a population at higher risk for SI. Individuals with amputation related to diabetes mellitus (DM) may be at particular risk because the presence of comorbid depression and DM has been linked with an increased risk of SI compared with that associated with DM alone,[16] and because the link between depression, SI, and suicide attempts is well established.[17-19] Thus, an individual with a recent dysvascular lower extremity amputation (LEA) may be at a greater risk for SI, and consequently, suicide attempts or death by suicide.

Although less frequently discussed, some individuals report SI in the absence of depressive symptoms. In a study[20] of 11,015 primary care patients, 5.4% reported SI without depressive symptoms. In a sample of adults older than 75 years who endorsed SI in the past 2 weeks, only 50% met the criteria for a major depressive episode; among those who endorsed SI without depressive symptoms, impairments in activities of daily living (ADL) were significantly associated with SI.[21] There is even less information on individuals who attempt suicide in the absence of depressive symptoms or other psychiatric disorders, although 1 study[22] did note that approximately 11% of participants who attempted suicide did not meet *Diagnostic and Statistical Manual of Mental Disorders, Third Edition* criteria for a psychiatric disorder.

Although psychiatric comorbidities have well-established associations with SI,[23,24] there is some evidence that physical comorbidity also leads to both increased depressive symptoms[3] and increased SI.[25,26] Research shows that individuals with chronic health conditions have an elevated risk for SI,[8,27,28] but comparatively little is known about SI in individuals with dysvascular LEA. Several studies[29,30] have reported that 20% to 29% of amputees experienced SI in the first few weeks after amputation. Another study[31] found that 36% of respondents who sustained amputations as a result of motor vehicle collisions endorsed SI. While amputation appears to be associated with an increased likelihood of SI, research has not explored the potential relation between known associates of SI (eg, depressive symptoms, self-efficacy) and amputation-specific experiences (eg, mobility and mobility satisfaction, impairment in ADL).

The present study sought to examine the estimated prevalence of SI 1 year after LEA secondary to complications from peripheral arterial disease (PAD) and DM. It was expected that individuals undergoing LEA would report increased levels of SI relative to the general population. The study also examined correlations with variables thought to be risk factors for SI in this population, including variables that have previously demonstrated correlations with depressive symptoms or SI in other populations (ie, age,[12,13] alcohol misuse,[32,33] smoking status,[34,35] mobility and satisfaction with mobility,[36-39] ADL and satisfaction with ADL,[21,40-42] pain,[43,44] social support,[45-47] self-rated health,[48-51] self-efficacy[52]). Additionally, this study's secondary aim was to evaluate the ability of a brief screening for depression to identify patients with recent SI.

List of abbreviations:

ADL	**activities of daily living**
DM	**diabetes mellitus**
LEA	**lower extremity amputation**
MDD	**major depressive disorder**
PAD	**peripheral arterial disease**
PHQ-9	**Patient Health Questionnaire-9**
SI	**suicidal ideation**

Methods

Study design

This cross-sectional secondary analysis is part of a larger multisite prospective cohort study of individuals undergoing LEA because of PAD or DM at 2 Veterans Affairs medical centers, a university hospital, and a level I trauma center. Participants were assessed via in-person or telephone interview at 12 months postamputation. Additional details of the study design are described elsewhere.[36,53] This study was conducted in accordance with the procedures approved by the human subjects review boards at each study site.

Participants

Participants were considered eligible if (1) they were aged ≥18 years; (2) they were awaiting (or underwent in the last 6wk) a first major LEA, defined as transmetatarsal level or higher; and (3) the primary cause of amputation was DM or PAD. Subjects were excluded if they had any of the following: (1) cognitive or language impairment that would preclude consent or participation, defined by >4 errors on the Short Portable Mental Status Questionnaire[54]; (2) prior amputations; (3) nonambulatory before admission to the hospital for reasons unrelated to impairment of the extremity awaiting amputation; or (4) planned bilateral amputation. Of 239 individuals screened between 2005 and 2008, 136 (57%) met study criteria and 87 (64%) enrolled. Of these, 70 (80.5%) had complete data regarding SI at 12-month follow-up.

Measures: potential correlates of SI

Demographic information

For data analyses, covariates were dichotomously coded as follows: sex, male (0) or female (1); race, white (0) or nonwhite (1); and amputation level, below knee (transtibial or transmetatarsal, 0) or above knee (transfemoral, 1). Age and education were reported in years.

Depressive symptoms

The Patient Health Questionnaire-9 (PHQ-9),[55] a commonly used inventory of depressive symptoms,[56-58] was used to assess both the level of depressive symptoms and the presence of SI in the past 2 weeks at 12 months. A sum score of the first 8 items (ie, all symptoms except for SI) was computed. Possible scores range from 0 to 24, with higher scores representing greater depressive symptoms.

Depression screen

As proposed by the United States Preventive Services Task Force, a minimal screen for depression was included.[59] Individuals who endorsed experiencing anhedonia or depressed mood on more than half of the days in the past 2 weeks (items 1 and 2 from the PHQ-9) were considered screening positive for depression and coded as 1, and those who screened negative were coded as 0.