CLINICAL MANAGEMENT extra

Identifying Pain and Effects on Quality of Life from Chronic Wounds Secondary to Lower-Extremity Vascular Disease: An Integrative Review

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Stacy Newbern, BSN, CWCN, OMS, RN-BC, FNPs • Wound Care Supervisor • Central Peninsula Hospital • Soldotna, Alaska

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GENERAL PURPOSE:

To provide information to enable better assessment and management of patients with lower extremity vascular disease (LEVD) chronic wound pain.

TARGET AUDIENCE:

This continuing education activity is intended for physicians, physician assistants, nurse practitioners, and nurses with an interest in skin and wound care.

LEARNING OBJECTIVES/OUTCOMES:

After completing this continuing education activity, you will be able to:

1. Identify the issues associated with lower extremity vascular disease.

2. Interpret the methodology and findings of this integrative review research project.

ABSTRACT

A lack of wound pain validation and provider understanding about the effect of pain on quality of life are the biggest barriers to pain management for patients with chronic wound pain. There is also a need for a holistic, validated pain assessment tool for these patients. This is an integrative review of the literature intended to identify gaps in pain identification and (re)assessment for patients with chronic wounds related to lower-extremity vascular disease.

KEYWORDS: chronic wounds, diabetes mellitus, lower-extremity vascular disease, pain assessment, pain tool, quality of life, wound pain

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INTRODUCTION

Diabetes mellitus type 2 (DM2) is a global health problem affecting approximately 382 million people worldwide in 2013.[1] There are an estimated 29.1 million people in the United States diagnosed with DM2.[2] An estimated 50% of patients with DM2 experience lower-extremity vascular disease (LEVD) and diabetic neuropathy.[3] Approximately 90% of individuals with lower-extremity amputation have a history of ulcerations associated with pressure injury, lower-extremity neuropathic disease, and lower-extremity arterial disease, collectively called LEVD.[4] Neuropathic foot ulcerations and LEVD are associated with low quality of life (QOL) because of associated pain and difficulty walking.[5]

Chronic wounds cause decreased functional ability and QOL for 1% to 3% of individuals 60 years and older. The healing process for a chronic wound can take 6 to 8 months or longer; some patients live with their wounds for 15 years or more.[6,7] The prevalence of pain with chronic wounds is 48% to 81%, with 19% to 46% of patients reporting moderate to severe pain.[6] Chronic wound pain that led to sleep disturbances, depression, and anxiety was reported by 27% to 67% of individuals experiencing pain with chronic wounds.[6]

Anxiety, depression, insomnia, hopelessness, inability to perform activities of daily living, and financial hardships can be the result of unmanaged pain. Unmanaged chronic wound pain can lead to the development of psychosocial issues such as fear of treatment and embarrassment because of physical limitations.[8] Recurrent pain that is untreated is associated with increased chronic stress.[9] Low QOL is associated with poor health outcomes and long-term prognosis, increased risk of comorbidity, and shortened life span. In 1 study, health-related QOL was a predictor of major amputation and death for patients who experienced all or some of the QOL deficits (mobility restrictions, self-care deficits, inability to perform usual activities, pain, and discomfort).[10] Provider awareness of the direct effects of pain on QOL and overall health status is paramount to promoting appropriate pain management.

Purpose

Multiple studies describe lack of wound pain validation is a significant barrier to pain management for patients with chronic wound pain.[3,11–13] The lack of a clinical assessment instrument has also been identified as a barrier to adequate assessment. In a study performed by Solowiej et al,[14] the need for a validated tool to assess pain and stress effects in primary care was identified. Upton[15] authored a second research article that again identified the need for a validated assessment tool and investigated the negative health outcomes of failing to treat pain associated with chronic wounds.

There is a gap in healthcare provider knowledge related to pain assessment and management in primary care. In a study by Dickinson et al[12] describing the characteristics of wound pain associated with diabetic foot ulcers, a difference in clinician- and researcher-reported pain prevalence was found, and further investigation showed that clinicians often underassess pain prevalence when they are not using a formal pain assessment tool.

This article seeks to determine what factors in primary care affect the assessment of pain and QOL related to chronic wounds secondary to LEVD. The purpose of this project was to review articles that identified patients with LEVD and chronic wounds and further, had them describe their perceptions of pain and the effects of this pain on their QOL. This project highlights the need for a holistic pain assessment instrument for use in the primary care setting to evaluate and reassess pain experience, including its effects on QOL, for patients with chronic wounds secondary to LEVD.

The expected outcome of these findings is an increase in primary care provider knowledge regarding wound-related pain experience and the standardized inclusion of QOL factors in pain assessment. This integrative review of the literature explores the need for a holistic pain assessment instrument for use in primary care settings.

Background and Significance

The pathogenesis of LEVD offers important clues regarding the origin of pain, therefore increasing understanding of how to develop pain management programs to address specific types of pain. The heart and lower extremities are the primary areas for fibrous plaque formation that results from chronic inflammation and altered cellular function.[16] Lower-extremity vascular disease results from decreased blood flow to and from the extremities because of atherosclerosis (when vessels calcify and become narrowed or blocked with fibrous plaques). These plaques can partially or fully block the lumen of the vessel or become unstable (complicated plaques) and rupture, causing rapid thrombus formation and occlusion of the affected vessel.[17] Blockages cause decreased blood flow to or from the extremity and ischemia, which increases risks of developing chronic, nonhealing wounds.

Pain related to these wounds can be nociceptive, neuropathic, or mixed nociceptive/neuropathic pain. Nociceptive pain is acute pain that resolves with the removal of noxious stimuli, such as what is felt with wound debridement. Neuropathic pain results from nerve pathway damage and occurs over extended periods. It can be waxing and waning, triggered by movements or actions, and can range from mild to severe. Patients who suffer from pain related to LEVD can have mixed nociceptive/neuropathic pain. Nociceptive pain is normally treated with analgesics such as nonsteroidal anti-inflammatory drugs and opioids. Neuropathic pain responds to antiseizure and antidepression medications rather than analgesics. Mixed nociceptive/neuropathic pain requires ongoing assessment and evaluation of patient response to interventions with a careful balancing of pain management strategies.[8]

Assessment and management of pain experienced with chronic wounds stemming from LEVD are not consistently performed in the primary care setting, and this may be related to the failure of providers to consider disease processes leading to pain and the effects of different pain management strategies on target areas. Another barrier to pain assessment in these patients is the lack of a holistic pain assessment instrument to assess for pain at the initial patient-provider encounter; ideally, such an instrument could be used again at subsequent encounters to monitor responses to interventions, changes in pain perception, and QOL related to pain.

This review of literature has identified that pain has a direct effect on QOL, it may present as symptom clusters, and there is a gap in knowledge related to pain management for patients with chronic wounds secondary to LEVD in the primary care clinic setting. An additional finding was the lack of a pain assessment instrument specific to pain with chronic wounds related to LEVD. Painful symptoms are generally undertreated in the primary care setting because of subjectivity and social, cultural, economic, and psychological factors and are typically assessed with patient-reported outcome measures that do not capture the symptoms that accompany LEVD.[11] Wound pain appears to be present in individuals with neuropathic and neuroischemic diabetic foot ulcers and other lower-extremity wounds, which is significant because wound pain is associated with delayed wound healing and poor QOL.[8] Current pain management practices for these types of wounds may not accurately assess or manage pain, indicating a need for a more comprehensive instrument that includes open-ended questions and pain descriptors specific to neuropathic and nociceptive pain.[12] The Centers for Disease Control and Prevention recommends using a combination of instruments including the Pain-Enjoyment-General activity (PEG) tool, Brief Pain Inventory (BPI), Promise 10, Oswestry Disability Index (ODI), Roland Morris Disability Questionnaire (RMDQ), Personal Health Questionnaire (PHQ-9), and General Anxiety Disorder (GAD-7) to obtain a thorough assessment of pain and alterations in QOL resulting from lack of pain management.[18] An additional consideration is the need to assess how effective pain management is by using the same instrument to reevaluate pain and affected QOL parameters after treatment. The initial assessment and reassessment should include assessing factors such as anxiety, hopelessness, insomnia, depression, and ability to perform activities of daily living as markers of how effective pain interventions are.

METHODS

Project Objective and Goals

The objective of this integrative review is to describe the experience and perceptions of pain and pain management for patients with chronic wounds related to LEVD. The goals of this study are to clinically appraise the evidence for efficacy of existing assessment practices, identify barriers to providing holistic patient care with pain management, and acknowledge pain impact on QOL.

Outcomes predicted to be gained from the integrative review include gaining knowledge regarding how to assess pain and QOL appropriately and increased patient compliance, improved wound healing, and chronic disease management with pain assessment that directs pain management for patients with chronic wounds secondary to LEVD in the primary care setting. Other benefits may be an increase in patient satisfaction and QOL.

Literature Search

An integrative review of the current and past literature was performed to provide a comprehensive overview and understanding of the phenomenon of pain and the effects of pain on QOL for patients with chronic wounds secondary to LEVD and to identify gaps in knowledge related to assessment of the phenomenon. The integrative review was chosen as the method of review for this study because of inclusion of both experimental and nonexperimental research in an effort to promote holistic understanding and evidence-based practice. A review of the literature using CINAHL, Google Scholar, PubMed, written journals, and scholarly textbooks was performed. The keywords "lower extremity wounds," "vascular wounds," "chronic wounds," "vascular disease," "diabetes mellitus type 2," "pain measurement," "dressing change," "debridement," "clinic assessment," and "quality of life" were searched in various combinations to identify articles specific to chronic lower-extremity wound pain assessment and the impact of pain on QOL and continuing health status.

Inclusion criteria included a date of publication between 2012 and 2017; descriptive, qualitative, mixed, or quantitative studies; a study population of adults with chronic wounds present greater than 1 month and a diagnosis of LEVD; and studies that focused

on wound pain effect on QOL and/or provider assessments of pain with chronic wounds and LEVD. Only instruments that assessed for pain were included (instruments designed to assess QOL other than in relation to pain were not evaluated).

Exclusion criteria included studies performed prior to 2012; studies involving children 18 years or younger; articles in languages other than English; studies including acute wounds, burns, or surgical wounds; studies that focused on assessments not related to pain perceptions; studies that evaluated QOL influenced by factors other than chronic wounds; and studies that focused on pain interventions.

RESULTS

While thousands of articles exist on these subjects individually, the research for these subjects in combination yielded 36 peer-reviewed articles. The Google Scholar search yielded the most significant studies relevant to 2 or more of the keywords and included 6 recent qualitative studies and 4 recent systematic reviews that combined 4 or more of the keywords, as well as 3 quantitative studies that focused on pain with chronic wounds or vascular wounds. After further review, a total of 14 articles met the inclusion criteria for this review.[5–7,9–13,19–24]

Data Evaluation

Select studies that met the inclusion criteria for relevance to the clinical question were critically appraised for relevance to the topic, validity of results, applicability to broad populations, bias, and grade of evidence.[25] The intention of the research was to identify common themes and/or descriptors of pain and effects on QOL and to identify assessment instruments and level of evidence for use in practice.

Data were reviewed and divided into 2 categories: (1) patient perceptions of pain effects on QOL when living with lower-extremity chronic wounds and (2) current pain assessment practices and instruments used for evaluating and treating lower-extremity chronic wound pain. Subcategories under patient perceptions of QOL included pain as a single factor and pain as a causative factor of other sensations that decrease QOL (Table 1). The literature reviewed identified multiple pain assessment instruments used for pain assessment. Pain assessment practice instruments were categorized with the number of articles in which they were utilized (Table 2).

The Hospital Depression and Anxiety Scale was used in 1 study to relate pain perceptions and delayed wound healing to increased depression and anxiety and was therefore included in this review because of its relevance.[19] The Brockopp-Warden Pain Knowledge/Bias Questionnaire was also used in 1 study.[20] This study was considered relevant for describing patient perception of pain in comparison with provider perception of pain.

The assessment instruments examined are related to pain and pain effects on QOL. Studies included in the research could be reproduced or validated previous studies using the same instruments. Credibility was validated by using studies that were peer reviewed, scholastic, and/or published in medical journals or by nationally recognized associations. Reliability was established by selecting studies that involved robust sample sizes, repeated measures, constant comparisons, and secondary analysis (Table 3). All intervention studies referenced evidence from previous studies related to the same phenomena as comparisons for their results.

DISCUSSION

The need for wound pain validation and further studies related to holistic pain identification, including the psychosocial aspects of pain, has been identified.[13] One study identified localized leg symptom clusters that include pain, fatigue, exudate, inflammation, and edema that have profound effects on physical QOL for patients with chronic lower-extremity wounds and should be considered during assessment and management to improve QOL.[21] An additional study of this phenomenon found that comprehensive assessment of localized leg symptom clusters helps identify patients at risk of delayed healing. More research is needed to determine the strength of the relationship between these symptom clusters and delayed wound healing.[7]

Multiple studies indicated that chronic pain experienced with LEVD and chronic wounds decreased QOL and identified common factors such as social isolation, interrupted sleep patterns, mobility and activities-of-daily-living dysfunctions, depression, anxiety, and hopelessness. One study reported higher pain prevalence rates using formal assessment instruments compared with single-question instruments and suggests that using pain tools, including pain timing, with other instruments may provide more accurate assessment.[12]

There is no pain assessment instrument specifically validated for diabetic foot ulcers or chronic lower-extremity wounds.[14] Multiple studies were equivocal about whether single-question pain instruments are appropriate for assessing chronic wound pain secondary to vascular disease or if these instruments ask leading questions that direct patient responses rather than allowing patients to voice their perceptions of pain. The assessment of the instruments included in this research is limited by search criteria and published literature. There may be instruments that were not reviewed that may be better validated for evaluating neuropathic pain and pain symptoms.

Pain was described as a constant companion, overwhelming, incessant, and unrelenting, and exacerbated by dressing changes and debridement.[22] Pain was a significant finding relevant to fatigue and depressive symptoms in 3 studies involving the identification of symptom clusters. One emergent theory identified 3 phases of

pain related to lower-extremity venous wounds: phase 1 is acute nociceptive pain that, if not treated, can develop into phase 2, pain with both nociceptive and neuropathic properties, and eventually, with inadequate pain management, patients develop refractory, long-term pain (phase 3).[23] Multiple studies listed factors exacerbating pain, such as inadequate pain management; neuropathic pain that is not acknowledged or managed; wound treatment including dressing changes, compression stockings, and debridement; and lack of pain assessment during office/clinic visits.

Practical Implications

Effective evaluation of the patient's perception of wound-related pain increases the likelihood of appropriate management of wound pain and improves patient QOL and satisfaction.[8] Recognizing and acknowledging the presence of pain with chronic wounds secondary to LEVD facilitate the holistic treatment of the patient including physical, psychological, and social impacts of chronic wounds.[24] The World Union of Wound Healing Societies consensus affirms healthcare providers' responsibility for ensuring wound-related pain control to reduce the potential for increased cost related to treating pain and stress.[9] Primary care providers are often the first point of entry for healthcare and should assess patient pain using a validated pain assessment instrument in an effort to provide individualized pain relief for lower-extremity wound pain as part of a comprehensive, holistic plan of care for chronic disease management.

Limitations

This literature review may be limited by the lack of data reported regarding pain assessment and in terms of cultural, racial, and ethnic diversity of patients with chronic wounds secondary to LEVD. Assessment of the instruments included in the review is limited by search criteria and published literature and lack of common comparators or a validated tool specific for assessing pain associated with chronic wounds related to LEVD. Pain is often multifaceted and not easily classified as chronic or acute. Analysis of the literature is limited by the evidence and the classifications of pain in the current literature.

Table 1.
PAIN AND QOL DOMAINS ADDRESSED BY REVIEWED STUDIES

Literature Exploring Pain and Pain Effects on QOL	Single Domain	Multiple Domains
Siersma et al,[10] 2014		Health-related QOL domains: social connectedness, depression, pain related to diabetic foot ulcers, and increased risk of amputation and mortality
Ousey and Edward,[19] 2014		Psychological impact of pain for patients with wounds, anxiety, depression, stress
Dickinson et al,[12] 2016	Pain	Health QOL
Taverner et al,[23] 2014		Pain phases with negative consequences of insomnia, depression, suicidal ideation
Faghihimani et al,[5] 2014	Pain only as an indicator of claudication and worsening of disease process	
Woo,[13] 2015	Pain	Anxiety related to anticipation of pain
Bredfeldt et al,[11] 2015	Painful symptoms	Sleep disturbance, QOL
Do et al,[21] 2016		Symptom clusters of pain, fatigue, and depressive symptoms; symptom clusters of pain, fatigue, edema, lower limb inflammation, and exudate
Fearns et al,[24] 2017		Sleeplessness, anxiety, depression, restricted well-being
Finlayson et al,[7] 2017		Clusters of pain, depression, fatigue, sleep disturbances
Green et al,[22] 2014	Pain	Pain and wound exudate, odor, impact on mobility; depression, low mood, hopefulness
Edwards et al,[6] 2014	Pain	Depression, activities of daily living (functional ability)
Schreiber et al,[20] 2014	Pain	Pain as interpreted by the care provider
Matsuzaki and Upton,[9] 2013	Pain	Psychological stress and reduction in QOL

Abbreviation: QOL, quality of life.

Table 2.
PAIN ASSESSMENT INSTRUMENTS REVIEWED IN LITERATURE

Pain Instrument	No. of Studies
Medical Outcome Study Pain Measures	2
Modified EQ-5D Questionnaire	1
Brief Pain Inventory	1
The Neuropathic Pain Scale	2
The Neuropathic Pain Symptom Inventory	1
The Diabetic Peripheral Neuropathic Pain Impact Measure	1
The Short-Form McGill Pain Questionnaire	1
Numeric Pain Scale	2
SF-36 Health Status Questionnaire	1
Brockopp-Warden Pain Knowledge/Bias Questionnaire	1
Hospital Depression and Anxiety Scale	1

CONCLUSIONS

Primary care providers must acknowledge the impact of pain on QOL. Pain can precipitate depression, stress, anxiety, social isolation, and fear. Pain may be present without additional QOL factors or may be reported with clusters of symptoms. Nociceptive pain, neuropathic pain, and mixed nociceptive/neuropathic pain require different medical, psychosocial, and pharmaceutical interventions. Pain is often underreported by the patient, and providers should recognize that the patient may have a fear of becoming dependent on pain medications or being labeled a drug seeker, or may believe that pain is an unavoidable factor in his/her life.

A lack of validated provider assessment instruments and/or reluctance to acknowledge pain and its effects on QOL have been identified. Studies are currently in progress to explore the phenomenon that providers may not be acknowledging pain with chronic wounds because of reluctance to manage the pain. Additional research is needed regarding provider knowledge regarding pain and effects on QOL, as well as exploring multimodal management options for this patient population. A need for further studies regarding validated instruments that can be used in primary care settings for initial evaluation and reassessment of pain and related QOL issues is clear.

Table 3.
STUDIES INCLUDED IN THE INTEGRATIVE REVIEW

Type of Study	No. of Studies	Sample Size
Integrative/literature review	5	N/A
Secondary analysis	1	110
Secondary analysis with repeated measures	1	247
Cross-sectional with repeated measures	1	96
Descriptive cross-sectional study with convenience sampling	1	15
Case-control study	1	137
Longitudinal study with constant comparison	1	11
Observational prospective study	1	1088
Observational retrospective and prospective study	1	70
Quasi-experimental design	1	341

PRACTICE PEARLS

- Lack of a validated pain and QOL assessment tool for patients experiencing diabetic foot ulcers or chronic lower-extremity wounds is a barrier to appropriate pain management.
- There is a need for wound pain validation and further studies related to holistic pain identification including the psychosocial aspects of pain.
- Single-question pain assessment instruments may not be appropriate for evaluating neuropathic pain and may lead the clinical provider to undertreat pain and associated QOL symptoms.
- Symptom clusters including pain, fatigue, exudate, inflammation, and edema profoundly affect patient QOL and may increase the risks associated with delayed healing.
- A goal for practice should be identifying pain with other symptoms that affect QOL to improve patient outcomes.

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