

KEY WORDS

- ▶ Pain
- ▶ Leg ulceration
- ▶ Quality of life
- ▶ Pain assessment
- ▶ Analgesia

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WHAT DOES PRIMARY RESEARCH REVEAL ABOUT PAIN ASSOCIATED WITH LEG ULCERS?

Abstract

Background: In recent times, there has been increasing interest in pain associated with leg ulceration and the detrimental impact this has on the patient's quality of life. **Aims:** The author wished to examine the current received knowledge on leg ulceration and pain. **Methods:** Analysis of the literature was conducted through coding the data collected and processing it to find specific themes or categories. **Results:** The studies in the literature review overwhelming reports of pain in leg ulceration. These results challenge the previous contention that only arterial leg ulcers were painful for patients. **Conclusion:** The studies reviewed broached different areas, such as the extent of pain, impact on quality of life and emotional effects of leg ulceration. The overriding results, however, show that significant amounts of patients are experiencing pain as a result of their leg ulcers.

There has been an upsurge in interest in pain and leg ulceration in recent years, and it is becoming increasingly recognised that clinicians need to address pain issues, in order to enhance quality of life (QoL) for patients. This article identifies themes to aid understanding, primarily, to appreciate that all ulcers are potentially painful, regardless of aetiology. Although some patients report high levels of pain, analgesia is not being prescribed adequately by clinicians. However, clinicians play a key role in the management of pain in leg ulceration and patients look to them to provide solutions.

This evaluative review used current literature to find out what is known about pain and leg ulceration. Leg ulceration is defined as 'an open lesion between the knee and the ankle joint that remains unhealed for at least four weeks and occurs in the presence of venous disease' (SIGN, 2010). The majority of leg ulcers are venous in origin (70%), and approximately 10% are thought to have an arterial component (Hampton and Collins, 2004). The remaining 20% is made up of mixed aetiology leg

ulcers and other less common causes of leg ulceration, such as rheumatoid and haematological conditions, and skin cancers (Moffatt et al, 2007). The chronicity of leg ulcers can have a major impact on a patient's QoL. One of the predominant causes of reduced QoL that recurs in the literature is pain (Hofman et al, 1997).

PAIN

Pain has been defined as a sensory and emotional experience that is both complex and necessary for survival (Gould, 2007). There are two main types of pain, neuropathic and nociceptive (World Union of Wound Healing Societies [WUWHS], 2004), although Vuolo (2009) suggests that there are three types, citing emotional pain. It is important not to underestimate the effect that physical pain can have on an individual's emotional wellbeing and that emotional pain can be as limiting as physical pain.

Pain can be acute or chronic and it can present in different ways, for example referred pain, focal pain, multifocal pain (Gould, 2007). Pain is complex and can be difficult to understand due to the fact

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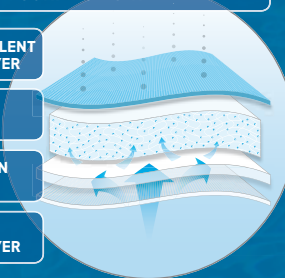
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that each person has their own individual perspective/belief about pain. This can vary from culture to culture (Lasch, 2000) and across gender (Dysvik et al, 2004).

Traditionally, venous leg ulcers were not thought to be painful unless they were infected or oedematous (Emflorgo, 1999; King, 2003). It was also widely accepted that arterial leg ulcers were painful due to ischaemia (King, 2003). Price et al (2007) state that because a wound involves a loss of skin integrity and severed nerve fibres, pain from the wound is both nociceptive and neuropathic.

Over recent years, there has been an increased focus on pain in wound care and the importance of assessment and management of pain. An early qualitative study of living with a venous leg ulcer by Walshe (1995) found that pain was the overwhelming characteristic of the experience. Similarly, a quantitative study by Hofman et al (1997) in venous leg ulcers found that 69% of patients identified pain as the worst thing about having an ulcer. There has been a gradual move towards focusing on the priority for the patient, rather than just focusing on wound healing as the main treatment (EWMA, 2002).

The development of two Position Documents has helped to highlight the need to manage pain for patients with wounds (EWMA, 2002; WUWHS, 2004). These documents primarily focus on reducing pain during dressing changes. This area was targeted because it was viewed by clinicians as the most painful time for a patient (Moffatt et al, 2002) and is also identified by patients as an area that exacerbates pain (Briggs and Torra i Bou, 2002).

Although these developments are positive, there are still many aspects of pain that are not well controlled. In the author's experience of assessing patients with leg ulcers, many experience high levels of pain caused by their ulcer.

This inequality between the level of pain that patients still seem to be experiencing and satisfactory pain management, has led to an onus being placed on pain and leg ulceration for this evaluative review.

‘Two of the studies found no statistical evidence between arterial/mixed and venous ulceration pain scores’

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THE STUDY

Aims

In essence, this literature review sought to answer the question: ‘What does primary research reveal about patients suffering from pain with leg ulceration?’

The objectives of the review were:

- ▶ To understand pain in leg ulceration further – what is known about leg ulcer pain from current literature?
- ▶ How can we give optimum care to patients with painful leg ulceration?
- ▶ To find evidence on which to base practice and to make recommendations for practice/ further research.

Literature search

A search strategy was conducted to find primary research on the subject of leg ulcer pain that was relevant to the review

question, using electronic databases, websites, snowballing sampling and hand-searching. A mixture of qualitative and quantitative papers were found — see *Tables 1* and *2*.

Data analysis

In the qualitative papers, analysis was performed by coding the data collected and processing it to find themes or categories. For example, Douglas (2001) and Husband (2001) both used grounded theory. Mudge et al (2006) used phenomenological (the study of the structure of subjective experience and consciousness) analysis to identify the major themes. In Hareendran et al’s (2005) study, which used mixed methods, two psychologists performed the analysis, which reduced the potential for bias when interpreting the results.

Table 1
Similarities in qualitative studies

Study	Pain	Analgesia	Clinician relationship	Footwear
Douglas (2001)	<i>Pain was an overwhelming feature that had a profound effect on patients’ lives</i>		<i>Patients and carers had no understanding of the underlying cause of leg ulceration. They received conflicting advice</i>	
Hareendran et al (2005)	<i>Pain was the most common cause of functional limitation</i>	<i>Not all patients were prescribed or used analgesia</i>	<i>Although most patients were satisfied with nursing care, they were dissatisfied with treatment practices and had various unmet needs in relation to healing and reduction of symptoms</i>	<i>Footwear was a big problem, patients reported feeling unattractive and self-conscious</i>
Husband (2001)	<i>Universally mentioned as the most serious problem</i>	<i>Generally found analgesia ineffective. GPs and nurses generally did not address pain</i>		
Mudge et al (2006)	<i>Patients felt that pain was an inevitable part of their condition that had to be tolerated</i>		<i>Patients were not able to offer clarification of venous leg ulceration or understand why compression bandaging was being used</i>	<i>Footwear formed a central focus of patients’ body image, causing anxiety and embarrassment</i>

‘It is clear from these studies that venous and mixed leg ulcers can be extremely painful and distressing for patients’

There were several similarities in the findings of the qualitative data (*Table 1*), which will be discussed later.

For the quantitative studies, five used the statistic package for social sciences (SPSS) to analyse data (Nemeth et al, 2003; Hareendran et al, 2005; Jones et al, 2006; Briggs et al, 2007; Van Hecke et al, 2009). Apart from Briggs et al’s (2007) study other tests were also performed to analyse data. Parametric tests, such as the t-test, were used to determine differences between those with and without pain (Nemeth et al, 2003).

Nemeth et al (2004) used paired t-tests to assess significant differences in pain scores over the six time periods and Hareendren et al (2005) used them to test three domain scores (men and women, patients with and without pain, ulcers healing and non-healing). Heinen et al (2007) used the t-test to compare means of continuous variables (age, QoL, pain score) against venous and mixed recurrent wounds. Nemeth et al (2003) also used another parametric test, analysis of variance (ANOVA) to compare the characteristics of the participants because of the three phases of the study. Non-parametric tests were also used.

A chi-squared test was used in five of the studies (Nemeth et al, 2003; Goncalves et al, 2004; Jones et al, 2006; Heinen et al., 2007; Van Hecke et al, 2009) for cross-tabulation of different variables. Nemeth et al (2003) also used the Mann-Whitney and Kruskal-Wallis tests to determine differences between the study groups and periods. A Mann-Whitney test was also used by Goncalves et al (2004), but no detail was given about what it was measuring. Two studies — Jones et al (2006) and Van Hecke et al (2009) — used Cronbach’s alpha to measure the internal consistency of the instruments.

Results

Two of the studies (Briggs et al, 2007; Heinen et al, 2007) found no statistical evidence between arterial/mixed and venous ulceration pain scores. Goncalves et al (2004) found that, statistically, women and patients with partners reported more intense pain than males and people without partners, however, Briggs et al (2007) and Hareendran et al (2005) found no statistical difference between male and female levels of pain.

Another area of difference in results was the subject of ulcer size and duration. Franks and Moffatt (2006) identified higher levels of pain if the ulcer was

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Table 2
Comparative data from quantative studies

Study	% reported pain	Mean pain score	% pre-scribed analgesia	% taking analgesia	% reporting exudate	% with depression	% with leg oedema
Briggs et al (2007)	100	4.4					
Goncalves et al (2004)	96.6	3.1	80				
Hareendran et al (2005)	80.5				77.8	44.4	
Heinen et al (2007)	85	4.6	75	25		74	40
Jones et al (2006)	73				83	27	
Nemeth et al (2003)	48–59	<3		50			73–81
Nemeth et al (2003)	85	2.4	53	66			90
Van Hecke et al (2009)	82.9		33	52			

KEY POINTS

- ▶▶ All leg ulcers are potentially painful, regardless of aetiology
- ▶▶ Pain remains a major concern for patients with leg ulceration, but is often not fully understood or addressed by clinicians
- ▶▶ Analgesia is under prescribed by clinicians and underused by patients
- ▶▶ Pain has a major impact on other quality of life factors for the patient.

Table 3
Aetiology (%) of leg ulcers in the studies.

Study	Venous	Mixed	Arterial	Diabetic	Neuro-pathic	Unknown
Briggs <i>et al</i> (2007)	54	13	28			5
Douglas (2001); Franks and Moffatt (2006)	100 77	23*				
Goncalves <i>et al</i> (2004); Hareendran <i>et al</i> (2005)	82 100	3	1	11	3	
Heinen <i>et al</i> (2007); Husband (2001)	50 100	50				
Jones <i>et al</i> (2006); Mudge <i>et al</i> (2006)	100** 100					
Nemeth <i>et al</i> (2003); Nemeth <i>et al</i> (2004)	56 80	44 20				
Van Hecke <i>et al</i> (2009)	100^					

*Not specified if mixed or arterial

**States venous but includes all ulcers with an ABPI of >0.6 which would indicate mixed / arterial

^Not verified by ABPI so could be different mixed/arterial

greater than 10cm and had been present for a longer duration, but Briggs *et al* (2007) and Heinen *et al* (2007) found no statistical difference in the two areas. Hareendran *et al* (2005) found that ulcer size and duration was not significantly linked to QoL scores.

Major findings relating to patients in pain with leg ulceration include:

- ▶▶ All leg ulcers are potentially painless, regardless of aetiology
- ▶▶ Pain remains a major concern for patients with leg ulceration, but it is often not fully addressed or understood by clinicians
- ▶▶ Analgesia is under prescribed by clinicians and underused by patients
- ▶▶ Pain has a major impact on other QOL factors for the patient.

DISCUSSION

The studies in the literature review overwhelmingly report pain in leg ulceration (Table 2). Most of the studies were looking at pain in venous and mixed aetiology leg ulcers, although Goncalves *et al* (2004) identified diabetic and neuropathic ulcers in their study, while Briggs *et al* (2007) found arterial ulcers

and ulcers of unknown origin (Table 3). The results of the studies challenge the once-held view that only arterial leg ulcers are painful (King, 2003). There appear to be no studies on pain and leg ulceration focusing purely on arterial leg ulcers, which may add further knowledge and insight. It is clear from these studies that venous and mixed leg ulcers can be extremely painful and distressing for patients.

The Briggs *et al* (2007) study calls into question whether it is the type of pain, rather than the aetiology and the position of the ulcer, that could be most relevant. They found that patients with neuropathic symptoms had higher than average pain scores and ulcers took longer to heal than those with no neuropathic symptoms. These results cannot be generalised by themselves as there were some limitations to the study, but further research would be beneficial in this area. There are mixed results on whether a larger ulcer or one lasting for a longer duration results in higher levels of pain. The pain scores were taken from the numerical rating scale of 1–10. From the data, there seems to be a correlation between high mean pain

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‘The studies also showed that patients look to clinicians to provide relief from pain with analgesia, but are often not being managed effectively’

Table 4
Study data on analgesia.

Study	% prescribed analgesia	% taken by patient	% effectiveness	Type of analgesia prescribed
Goncalves et al (2004)	80			70% anti-inflammatory
Heinen et al (2007)	75	50	84 (70% experienced tenable pain after analgesia)	
Nemeth et al (2003)		50	75	
Nemeth et al (2004)	53	66		67% opioid
Van Hecke et al (2009)	33	52		

Qualitative findings regarding analgesia:

- ▶ Patients felt that pain was inevitable and had to be tolerated. They did not go back to the nurse or take pain relief if the pain was worse than usual (Mudge et al, 2006)
- ▶ Patients reported that analgesia was often inadequate and that no one really understood about their pain. Patients admitted not always reporting pain and put it down to the ageing process (Douglas, 2001)
- ▶ Most patients felt that they needed analgesia but often found prescribed analgesia ineffective and patients generally found little help from the doctor or nurse regarding pain relief so sought over-the-counter drugs, which were not effective either (Husband, 2001).

scores and a lower percentage of patients taking analgesia.

The results show that common theories about pain and leg ulceration need to be challenged. The view that arterial leg ulcers are more painful than venous was not supported in the studies (Briggs et al, 2007; Heinen et al, 2007).

Clinicians' perception of pain

Husband (2001) found that nurses recognised that patients with venous ulceration felt pain, but attributed it to either infection, oedema or arterial problems, which they dealt with through antibiotics, compression or removing compression respectively. Although these could be potential causes of pain, Husband (2001) found that the patients' pain was not adequately dealt with and that the nurses lacked an appreciation of the extent of pain that venous leg ulceration can cause. They seemed to use pain as a diagnostic factor, rather than dealing with it as a symptom in its own right (Husband, 2001).

Briggs et al (2007) also highlight the lack of recognition by clinicians of the level of pain patients encounter because they are rarely sent to specialist pain clinics, although pain was found to be as intense

as those attending a chronic pain clinic. Douglas (2001) found that patients reported that no one really understood their pain, although they could be including other people in that statement, it identifies that clinicians need to listen and empathise with the patient regarding their pain. Goncalves et al (2004) also state in their study that many clinicians do not recognise the patient's pain and that the patients felt that as well. They make the point that even mild pain, if it is prolonged, can be distressing (Goncalves et al, 2004).

From these themes, it is clear that clinicians have a central role to play in understanding, treating and evaluating pain in patients with leg ulceration. Although nurses have knowledge in wound care, it seems that they lack knowledge and understanding in pain management. This highlights the need for more training in this area. Husband (2001) found that no pain assessment tools were used by the nurses in her study. Since Husband's study, pain measurement has become a higher priority in wound assessment, but it must be an ongoing evaluation rather than just recorded at initial assessment and there needs to be an action plan to address patients' pain and measure outcomes.

‘Areas not investigated fully include common problems with leg ulceration, such as oedema and inflammation in relation to pain’

Table 5
Quality of life functions affected by pain.

<i>Function affected by pain</i>	<i>Study</i>
<i>Sleep</i>	<i>Douglas (2001); Hareendran et al (2005); Heinen et al (2007); Mudge et al (2006)</i>
<i>Mobility</i>	<i>Douglas (2001), Heinen et al (2007)</i>
<i>Social Life</i>	<i>Hareendran et al (2005); Heinen et al (2007)</i>
<i>Emotional — anxiety and depression</i>	<i>Jones et al (2006)</i>

Nurses need to understand that all aetiologies of leg ulcer can be painful and that even mild pain, if it is not resolved, is significant. It must not be assumed that because a patient does not say that they are in pain, it must automatically follow that they have no pain. Clinicians must gain an understanding of what prevents patients from taking analgesia so that this can be rectified.

Inadequate analgesia

The studies also showed that patients look to clinicians to provide relief from pain with analgesia, but are often not being managed effectively (Husband, 2001; Heinen et al, 2007). This could be due to lack of knowledge from the clinician or preconceptions about pain and leg ulceration. The subject of insufficient analgesia was highlighted in eight of the 12 studies.

The data show that 20–67% of patients are not being prescribed analgesia for the pain and of those that had, only about half of them were taking it regularly. It is not really surprising to note that patients are reporting that analgesia is not effective (Douglas, 2001; Husband, 2001; Nemeth et al, 2003; Heinen et al, 2007). The patients in the qualitative studies (Douglas, 2001; Husband, 2001) claimed that analgesia was inadequate and that they did not receive much help from the clinicians when they went to them for advice (Table 4). It is concerning that patients are not finding the help they need and appear to lack confidence in clinicians by seeking other alternatives (Douglas, 2001; Husband, 2001; Mudge et al, 2006). Another concern is that patients are not always reporting pain and seem to be resigned to ‘suffering in silence’ (Douglas, 2001; Goncalves et al, 2004).

QUALITY OF LIFE

Several of the studies looking at pain and

QoL found that pain was directly linked to several common factors (Table 5). Van Hecke et al (2009) acknowledge that pain control is a challenge, but if clinicians can reduce pain levels this will improve patients’ QoL, enabling them to have improved sleep, mobility and social life, which will also improve their emotional wellbeing.

SUMMARY

The studies reviewed cover different areas of concern for patients with leg ulceration, ranging from specific studies measuring pain to QoL issues and emotional effects of leg ulceration. The studies are both qualitative and quantitative in design, but despite the different paradigms, the overriding results are that significant numbers of patients are experiencing leg ulcer-associated pain but receiving inadequate help from clinicians.

The fact that several of the studies were undertaken within the last five years shows that although some effort has been made in addressing pain, such as at dressing change (EWMA, 2002; WUWHS, 2004), there is still work to do.

Areas not investigated fully include common problems with leg ulceration, such as oedema and inflammation in relation to pain. There is still a debate about whether compression bandaging causes or eases pain. Nemeth et al (2004) found that pain reduced over a five-week period, but the results need to be treated with caution due to the small sample size and length of time of the study.

Mudge et al (2006) and Henien et al (2007) reported that patients found the bandages painful, which could be due to poor application by a nurse (Edwards, 2003). This area warrants further investigation.

There was a lack of longitudinal studies on leg ulceration, which would provide a greater insight into patterns of pain rather than the many cross-sectional designs that provide limited detail.

CONCLUSION

This review has presented a wealth of information on instruments and data analysis regarding the patients' experience of pain and leg ulceration. There have been a few recent studies on pain that have helped to understand pain in leg ulceration further.

Although there are consensus documents on pain at dressing change, these do not address all the causes of pain and certain areas of pain management still need improving.

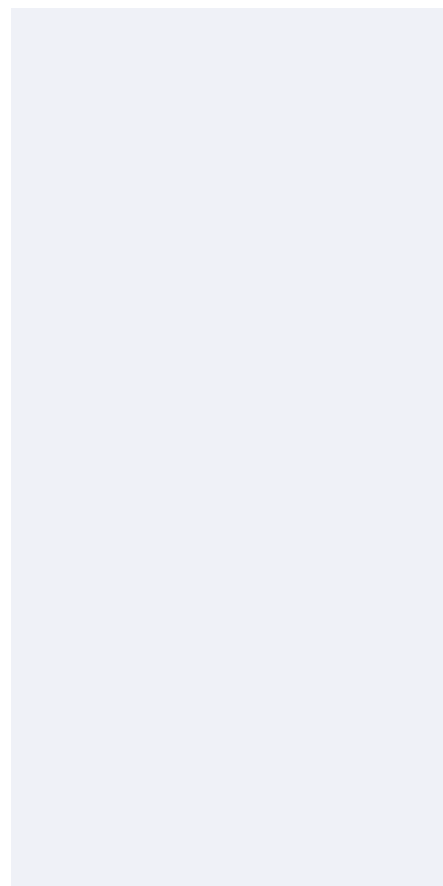
The review has enabled a greater understanding of pain and leg ulceration from the perspective that all ulcers are potentially painful regardless of aetiology. Size and duration of ulcer does not necessarily indicate more severe pain (Briggs et al, 2007; Heinen et al, 2007).

To improve evidence-based practice there are areas identified that warrant further research. In terms of analgesics, there needs to be an investigation into:

- ▶▶ Their effectiveness in regards to patients with leg ulceration
- ▶▶ Why patients do not take analgesia for pain relief in leg ulceration
- ▶▶ Perceptions of clinicians on administration and effectiveness of analgesia and leg ulceration
- ▶▶ What alternative treatment/therapies help in reducing pain in patients with leg ulceration.

It is recommended that further research in the following areas is undertaken:

- ▶▶ More longitudinal studies on the characteristics of pain
- ▶▶ Further studies on neuropathic pain in relation to leg ulceration
- ▶▶ Studies looking at the effect of oedema and inflammation on leg ulcer pain
- ▶▶ Studies looking purely at arterial leg ulcers and pain
- ▶▶ Investigation of coping strategies for patients in pain. **WUK**



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