Keywords Leg ulcers/Intravenous drug use/Injecting drug users

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In this article...

- How 'below the belt' intravenous drug use can result in leg ulcers
- Risk factors for venous leg ulcers linked with injecting drugs in the femoral vein
- Principles of venous leg ulcer care in patients with a history of injecting drug use

Understanding leg ulceration associated with intravenous drug use

Nursing Times Self-assessment

Key points

Leg ulceration in people who inject drugs is becoming more common

Prevalence of leg ulceration in this group has been estimated as 15%

Leg ulceration in this group is associated with injecting in the legs or the groin

Injecting drug users may be homeless and vulnerable and, as such, find it challenging to engage with healthcare services

Those with leg ulceration need a flexible and empathetic approach to their care

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Abstract Clinicians are reporting a rise in the number of people with leg ulceration and a history of injecting drug use. These tend to be younger people with few co-morbidities. Leg ulceration may appear long after injecting has ceased and may be long-standing before an individual seeks help. The ulcers are often (but not always), venous, and are closely associated with injecting into the femoral vein and a history of venous thrombosis in the limb. Assessment and management of ulceration is similar to non-injecting drug users, but there are usually differences in social circumstances that affect care. Unfortunately, there is very little evidence related to leg ulceration and people who inject drugs. This article gives an overview of the risk factors for, and assessment and management of, leg ulcers in this cohort.

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Leg ulceration is often considered to be a disease of old age but it is becoming increasingly common in a younger age group of people who inject drugs (PWID). Unfortunately, there is very little published evidence or literature available to inform care.

A study conducted in Glasgow revealed a 15% prevalence of leg ulceration in current and former injecting drug users aged up to, and including, 44 years (Coull et al, 2014). This is much higher than the accepted leg ulcer prevalence in the population as a whole, which is around 1% (Callam, 1992). Venous leg ulceration is categorised as end-stage venous disease and is usually preceded by visible signs of venous insufficiency on the lower leg such as:

- Ankle flare;
- Varicose veins;
- Skin staining and changes in the shape of the lower limb, in which the calf widens and the gaiter area becomes narrowed – commonly known as 'champagne bottle leg'.

People who inject 'below the belt' – namely, into their groin, legs and feet – are increasing their risk of developing venous disease and, subsequently, leg ulceration at a younger age. However, not all ulcers in PWID are venous in origin; some may be multifactorial due to arterial disease or co-morbidity.

Injecting process

The most common illicit drug injected in the UK is heroin. It is usually brown in colour and originates from Afghanistan. Heroin is prepared from the opium poppy and is often manufactured in unhygienic conditions, often on the ground (Zerell et al, 2005). The heroin produced may be contaminated with micro-organisms introduced during this manufacturing process,

including spore-forming bacteria such as *Clostridia* (Brett et al, 2005).

Heroin is mixed (cut) with a range of substances from gravy powder to drugs such as paracetamol. This cutting process reduces the strength of the heroin and increases the profits for the dealers. Injecting drugs users will not be aware of the content or strength of the drug they are using (Coomber, 1997).

Prior to injection the heroin is usually mixed with a liquid – usually water – and heated with an acidifier such as citric acid to dissolve it. The solution is then drawn up into a syringe, usually through a filter,and injected into a vein (Scott et al, 2000).

Although heroin is primarily the injecting drug of choice in the UK, it may be mixed with other drugs during the cutting process, or users may choose to mix it with other substances such as cocaine. Heroin that contains cocaine will numb the injection area, which means that, if the vein is missed, the normal warning sign of pain will be masked (Coull, 2016).

Fig 1. **Long-standing ulceration of the right gaiter area with skin staining in a 42-year-old former femoral injector**

Injection technique

Poor injection technique increases the risk of damage to the veins. Common problems include:

- 'Digging' – an injector penetrates the skin repeatedly trying to find a vein;
- 'Flushing' – the injectate is pushed forward through the syringe into the vein and then the plunger is drawn back, sometimes several times. This increases turbulence within the vein and can damage vein valves (Preston and Derricott, 2015);
- Missing a vein or the needle going through the vein and puncturing the other side of the vein wall – bleeding can occur, and a granuloma may form around the site. Missing the vein also increases the risk of infection (Hope et al, 2016).

Injecting drug users are encouraged to vary their injecting sites to preserve veins and limit tissue damage. Some sites, such as the feet or the groin, are riskier than others due to a heavy bacterial load on the skin. Injecting in the feet is also risky because the veins are peripheral and very small – it is easier to miss or puncture both sides of the vein and thereby inject into the surrounding tissue (Hope et al, 2016).

Risk factors associated with injecting drug use

Injecting in the legs or groin (femoral vein) are known risk factors for development of leg ulceration. Injecting in the groin is strongly associated with the development of deep vein thrombosis (DVT), which often occurs in the thigh (Coull, 2016). Clots may form because of the narrowing of the femoral vein from repeated injecting and the sluggish flow of blood in the thigh, possibly combined with long periods of inactivity. DVT is also a risk factor for leg ulceration.

Injecting in the femoral vein is becoming increasingly common among people who have been injecting drugs for a long time, as well as those who are new to injecting. This may be because:

- The femoral vein is large and can tolerate repeated puncture;
- The injection site is hidden from view and easily accessed without a tourniquet so those who inject in public places – such as people who are homeless – find it easy to access and quick to inject into (Preston and Derricott, 2015).

Over time, a sinus may develop over the femoral site, making access more visible. The vein can scar and thicken, and injectors report finding the vein harder to puncture, resulting in their need to use longer and larger-bore needles to inject successfully. Larger needles are associated with an increased risk of damage to the vein.

With repeated injecting the femoral vein's lumen becomes narrowed, leading to back pressure and venous hypertension in the lower legs, causing collateral veins to swell and become varicose (Coull, 2016). Feet may become discoloured and purple due to venous congestion. Further disease of the venous system may develop and other signs become visible on the lower legs such as skin staining (Fig 1), ankle flare and an inverted champagne bottle-shaped leg (Eklof et al, 2004).

In PWID, venous disease and associated ulceration may occur 20 years earlier than in the non-injecting population (Pieper, 1996) and may appear long after injecting has ceased. Ulceration can occur following simple trauma and patients do not necessarily associate their ulcer with injecting drug use, particularly when the ulcer appears at a site where no injecting has occurred – such as overlying the bony tibial crest. Ultimately, venous disease that has arisen as a result of injecting in the femoral vein creates a vulnerable limb with poor healing capability.

Injecting in the femoral vein carries risk as it lies in close proximity to the femoral artery and the artery may be traumatised by injecting close to it. If a needle misses the vein and hits the artery, injectors usually experience sudden and acute pain and the limb may become red or white.

If the needle penetrates the artery, the injecting equipment may be forcibly ejected due to the high pressure within the artery. If the injector has injected into the artery, the limb is at risk as the drug is dispersed to the peripheries rather than into the central venous system. This can cause blockage of the arterioles and capillaries, leading to cell death and necrosis. There is

also a risk of femoral aneurysm (Woodburn and Murie, 1996). If this occurs surgical intervention may be required.

People who inject drugs are at risk of serious infections, such as necrotising fasciitis, wound botulism and cutaneous anthrax due to the nature of the substances they inject (Health Protection Scotland, 2017; Grunow et al, 2013; Brett et al, 2004). Those caring for this group need to be aware of systemic signs and symptoms that may alert them to potentially life-threatening illness.

Assessment

Leg ulcers in people with a history of drug use tend to be venous in origin but this cannot be assumed and a full holistic assessment must be completed to exclude arterial impairment. Assessment of anyone with leg ulcers – whether injectors or not – should follow recommended protocols outlined in the Scottish Intercollegiate Guidelines Network's (2010) document on chronic venous leg ulcer management.

A comprehensive vascular assessment, including examination using a Doppler ultrasound scan and calculation of the ankle-brachial pressure index (ABPI) is essential as arterial involvement is possible, particularly in PWID who are smokers or have had previous surgery or infections affecting the arterial system. However, in younger people some small studies show that ABPI may be slightly higher than the acknowledged normal of 1.0 (Niblo and Coull, 2013; Male et al, 2007). These studies indicate that any assessment of PWID should consider this, as a higher ABPI may also indicate calcification and microvascular disease (SIGN, 2010).

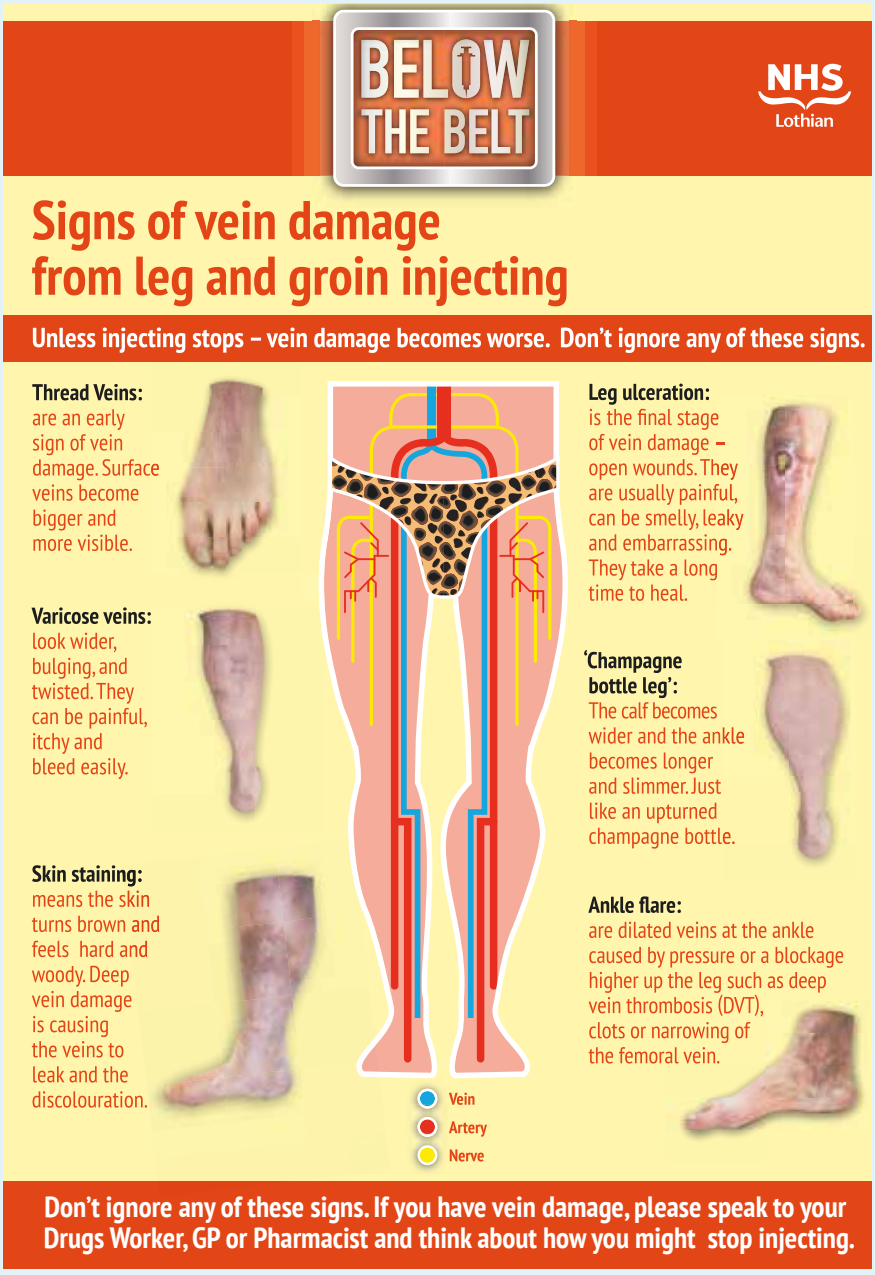
A holistic assessment should include an assessment of risk factors including injecting history. It is important to be sensitive, as illicit drug use is illegal and there needs to be a clear understanding of the nature of drug use and appropriate use of disclosure if there is the potential of serious harm to users or others. If appropriate, it may be helpful to find out:

- What drugs were injected;
- When they were injected;
- Which body sites were used to identify potential causes of leg ulceration.

People who inject drugs may be predisposed to ulceration through other risk factors, which include:

- History of leg fracture;
- Occupation (or hobby) that involves long periods of standing;
- Obesity;
- Multi-parity (SIGN, 2010).

Fig 2. **NHS Lothian's poster to increase awareness of risk**



These factors need to be considered as part of a holistic assessment.

Management

Venous ulcers are treated with compression; in younger people with no pre-existing co-morbidity, high pressures may be tolerated well (Hopkins et al, 2017). Multi-layer elastic bandaging may be suitable and, in fact, welcomed by some patients – particularly those who are homeless and sleeping outside. The warmth provided by multilayer bandaging may aid healing but health professionals need to be aware that a homeless person may be unable to afford to buy larger shoes to accommodate the bulk of bandages.

Alternatively, leg ulcer hosiery kits can be a useful alternative to weekly compression bandaging appointments and allows patients to self-manage to some degree (Coull, 2013). Compression bandages must be applied by a health professional trained in the procedure, but some patients can put on dressings and hosiery for themselves once the legs have been appropriately assessed, measured and the stockings have been fitted.

Some PWID may have chaotic lifestyles and find it difficult to engage with healthcare services. They may find it challenging to attend leg ulcer clinics regularly for a prolonged period for dressing or bandage changes. It is important to discuss with patients before assessment and treatment commences what leg ulcer management may entail, and ensure they understand that management will still be required after the ulcer has healed. Detailed explanations of pressures and the underlying venous damage caused by injecting are helpful in achieving concordance with care.

Weekly attendance for compression bandaging may be difficult and some degree of flexibility in managing care may be required. Sometimes it can be helpful to delay the first detailed vascular assessment until patients have attended for a repeat visit. This will help to assess their willingness to attend and adhere to treatment. Subsequently, reminder telephone calls may be useful. Arranging appointments for treatment that take place in the afternoon rather than the morning may also be helpful for a patient who is misusing substances and may have disrupted sleep patterns.

It is important when planning treatment to assess the patient's home circumstances. People who have been substance misusers may be homeless or roofless, and this may affect the choice of management. Many people who inject drugs may not live in social environments that are clean and do not have facilities to wash themselves or their clothing. Similarly, storage facilities for dressings and laundering facilities for hosiery may be limited.

Barriers to treatment

Current and former injectors may not seek help for physical problems due to the stigmas associated with substance misuse (Fowler et al, 2014). Many report poor and unpleasant treatment within care systems, which directly affects their willingness to seek help (Simmonds and Coomber, 2009). However, some problematic drug users also report feelings of worthlessness and shame, and suggest they are "not worth bothering with" (UK Drug Policy Commission, 2010). Many also have co-existing mental health problems.

Some professionals do not understand the pathways into substance misuse, and assumptions can be made that drug use is a hedonistic choice. However, PWID may have experienced difficult childhood incidents and trauma, leading to a lack of choices and opportunities over which they have had little control (UKDPC, 2010). A lack of knowledge and understanding from the professional can cause PWID to become isolated and reluctant to access healthcare services. They may also find it difficult to develop relationships with professionals in perceived positions of authority (UKDPC, 2010).

Nurses who assess the leg ulcers of PWID may have only one opportunity to engage them with services and encourage them to return for treatment.

Prevention

People who inject into their femoral veins may do so for many years without being aware of the potential damage to their lower limb (Coull, 2016). Similarly, health professionals may also be unaware of their patients' injecting habits and the implications for physical health. NHS Lothian has developed a poster (Fig 2) and cards that can be used to raise awareness among injectors and people accessing drug and alcohol services. These are useful tools to improve the knowledge of healthcare workers, and to use with patients to discuss risk.

Discouraging patients from injecting 'below the belt' is the mainstay in the prevention of venous disease in the lower limb in people who inject.

Conclusion

Leg ulceration in PWID is a significant and potentially growing problem with co-morbidities increasing in an ageing population. Risk factors include injecting into the groin and legs, and DVT. This group may have multiple medical and social problems that can cause barriers to engagement in services, and need to be treated with sensitivity and understanding. **NT**

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