Are chronic wounds a feature of frailty?

The concept of frailty is well established and is associated with an increased risk of hospital admission and death. Fried's frailty phenotype, Rockwood's 'frailty index', Isaacs's 'geriatric giants', and the 'acute frailty syndromes' all attempt to capture how to recognise frailty but fail to fully appreciate the physiological effects that ageing and frailty have on tissue integrity.[1,2]

There is a high prevalence of chronic wounds including pressure injuries, moisture lesions, leg ulcers, and diabetic foot complications in older adults, which we suggest is unlikely to be a direct effect of chronology but rather a manifestation of the multimorbidity and frailty more common in these age groups.[3,4] If chronic wounds are indeed a strong predictor of frailty in their own right, as clinicians we have a responsibility to be proactive in managing both the wound and the potential underlying frailty issues.

AVAILABLE EVIDENCE

There is a relative paucity of well-designed large population research to guide management of chronic wounds clinically. Wounds of seemingly the same aetiology often demonstrate wide heterogeneity of features and behaviour as well as often being found in patients with a variety of comorbidities, making it very challenging to perform robust research in this area. There is also still significant debate regarding how end points of wound healing studies should be defined, making meta-analysis of existing research often impractical.[5] Reasons for excluding older patients from studies are varied but include the challenge to control for the range of comorbidities; reduced mobility or access to transport, limiting their ability to participate in research visits; and issues surrounding consent and capacity.[6,7]

In addition to there being a relatively weak evidence base, there is also a paucity of guidelines for wound care in those living with frailty. A range of wound-specific clinical guidance is available from a variety of sources including the National Institute for Health and Care Excellence; Scottish Intercollegiate Guidelines Network; the International Working Group on the Diabetic Foot; and the European Pressure Ulcer Advisory Panel. However, none of these provide any specific guidance on managing those with frailty despite providing some advice that could be translated to this patient group. A National Pressure Ulcer Advisory Panel white paper details appropriate management for patients receiving palliative care who have pressure ulcers; while this is not specific for patients living with frailty, many issues affecting patients at the end of life can also affect those with advanced features of frailty and a similar pragmatic approach can be helpful.[8]

Box 1. Five things to consider when approaching a chronic wound

1. Chronic wounds are those that fail to progress through the usual stages of healing (haemostasis, inflammation, proliferation, maturation).
2. Identify and treat the underlying pathophysiology of a non-healing wound, such as arterial disease, venous impairment, pressure damage, or inflammation.
3. Create a favourable healing environment by addressing issues such as nutrition, oedema, or incontinence-associated dermatitis.
4. Follow the principles of wound bed preparation when selecting a wound treatment.
5. If a wound is not showing signs of healing despite the previous steps, re-evaluate.

WOUND HEALING

Despite a lack of specific research and guidelines for chronic wounds in the context of frailty, the main principles of wound healing still apply, while always being mindful of the likely impact of frailty on the disease trajectory. Chronic wounds (those that fail to progress through the stages of healing in an expected time) convey significant morbidity to patients.[9] Dressings and devices do not heal wounds but rather create a favourable environment to promote healing; to heal, first we must identify and treat underlying pathophysiology, such as rheumatoid arthritis, thrombosis, or diabetes. Second, we must address systemic issues, such as malnutrition (both under- and over-) that can be detrimental to healing and general health, with undernutrition and unintentional weight loss also being a strong predictor of frailty.[1,2] Local issues must then be treated, such as infection, oedema, and peri-wound dermatitis, to remove barriers to healing (see Box 1 for a suggested approach to managing a chronic wound). Despite these measures, some wounds can still fail to progress, but the reason they become chronic is currently not well understood. A range of research is ongoing to attempt to identify why wounds become chronic; an association with some patient characteristics has been identified but conclusive evidence is lacking. Observational data from Guest *et al*[10] estimate that the presence of a dermatological comorbidity increases the risk of developing a wound in the subsequent year (odds ratio 3.26, $P<0.001$), as does cardiovascular and musculoskeletal disease; however, their cumulative effect was not analysed and there is no available research analysing the direct effect of frailty rather than comorbidity on wounds.

It is not unusual for frail older patients to have varying degrees of 'organ failures', such as cardiac or renal, but it is less accepted that skin, the largest organ, can also fail. The term 'skin failure' is defined by Langemo and Brown as when *'the skin and underlying tissue dies due to hypo-perfusion that occurs with severe dysfunction or failure of other organ systems'*.[11] Skin failure can be acute (usually in the context of critical illness) or chronic, and is increasingly being recognised as a feature of the dying process in some patients approaching the end of their life who develop skin lesions such as pressure ulcers or 'SCALE' injuries (skin changes at life's end).[12] As skin 'fails', the structural integrity is disrupted and wound

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formation and impaired healing becomes more likely.

Falling is a common feature of frailty and can potentially cause injuries such as lacerations, haematomas, or pressure ulcers. Typically, falls are multifactorial and part of a wider spectrum of impaired mobility. If patients are unable to mobilise to facilitate venous return in chronic venous disease, or if patients cannot adequately reposition themselves to relieve pressure, tissue viability is compromised.[9]

Excess moisture causes maceration and increases the risk of tissue breakdown, most frequently seen as incontinence-associated dermatitis. Urine is particularly damaging to skin, as demonstrated in healthy volunteer studies when compared with water. In addition, urine or faeces contamination of wounds can impair healing through direct caustic and excoriating effects, as well as introducing bacteria.[13] This problem is not exclusive to pelvic wounds as patients in the clinic setting are seen with urine staining to lower-limb bandaging and leg wound maceration. Referral to an appropriate continence service in this situation may well be beneficial for preserving tissue viability and improving quality of life; all clinicians need to be mindful to consider continence in a range of presentations.

Vulnerability to medication side effects is another 'frailty syndrome' and has a direct effect on tissue viability. Wound healing can be compromised directly by the effect of medication such as steroids or nicorandil; tissue synthesis and immune response can be impaired by immunosuppressants; and tissue integrity can also be affected by tissue hypoperfusion as a result of medications such as antihypertensives or diuretics. Medications consequently require careful consideration in those who are frail and therefore more vulnerable to adverse events.[14]

CONCLUSION

A wound that fails to progress through the expected phases of healing and forms a chronic ulcer certainly seems to support the concept of frailty as a *'decline in reserve such that the ability to cope with stressors is compromised'* and, as discussed, a number of frailty syndromes predispose to wound formation or impaired healing.[1] The authors support the view that chronic skin failure can be a feature of chronic illness accelerated by various comorbidities, and suggest it may also be a feature of advanced frailty.

Recognition of frailty is crucial for all practitioners but is especially prudent in general practice where patients are usually seen earlier in their healthcare journey, giving a vital opportunity to address frailty before significant deficits become evident. The use of the electronic frailty score in primary care is helpful both to inform service provision and target interventions at appropriate populations; however, the authors feel that although 'skin ulcer' is recognised in this score it is not given the gravity it deserves. More work is needed to characterise the relationship between chronic wounds and frailty as it may be that chronic wounds should be classified as the sixth acute frailty syndrome, and wound healing and prevention is everyone's responsibility.

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