
An insight into how added complexity in risk assessments for the development of pressure ulcers may detract from widespread efforts to reduce their incidence

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Case Study

A gentleman, aged approximately 70, is a medical ward inpatient and has been for approximately one week. Prolonged diabetes and associated sensory neuropathy have contributed towards a diabetic foot ulcer, which has become necrotic and for which he is receiving intravenous antibiotics. The patient is awaiting a surgical review and is likely to have a digital amputation, until which he is under non-weight bearing restrictions.

Definitions

Diabetes refers to a number of metabolic diseases defined by the inadequate control of glucose levels within the body, and often relates to poor diet or a genetic tendency [Bilous and Donnelly 2010].

Diabetic sensory neuropathy features damage to nerve cells caused by the accumulation of the metabolites of glucose over time, with a resulting loss of sensation [Brooker et al. 2011]. As long nerves are often the most frequently affected, this usually leads to problems relating to the feet [Bilous and Donnelly 2010].

A diabetic foot ulcer is a wound, often exacerbated by infection, which results from the interaction between numerous predisposing factors and a subsequent disposition to injury. These include vascular and/or sensory changes which are themselves complications of long-standing diabetes [Dunning 2009].

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Abstract

In this article, I explore the possibility that the continued prevalence of pressure ulcers within UK hospitals is related to the unnecessary complexity of pressure ulcer risk assessments. The use of one case study; a gentleman with a prevalent number of significant risk factors, serves to conclude that many, if not all of the various sub-scores on the Waterlow risk assessment scale, ultimately exacerbate the risk caused by immobility and furthermore detract from his ability to mobilise. I therefore explore the possibility that an exclusive focus on reduced mobility as a risk factor could appear suitable as a risk assessment, and furthermore suggest that such a change could positively influence the care provided after an 'at risk' status is assigned. It is conceivable that the use of numerous risk factors, whilst informative, may nonetheless detract from clear, or perhaps even subliminal, lessons which relate to pressure area care.

Introduction

The presence of a diabetic foot ulcer has extensive implications for both the patient and his nursing staff. To highlight one example, the necessity of a non-weight bearing regime (which consequently results in long periods of lying or sitting) presents a conflict of interests between two roles integral to nursing care; namely, to alleviate the potential for further damage to the foot ulcer and the precautions taken to reduce the risk of the patient developing subsequent pressure ulcers. As many as 18% of hospital inpatients acquire such an iatrogenic injury [Moore et al. 2013, Stephen-Haynes 2013]. A pressure ulcer is 'a localised injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear. A number of contributing or confounding factors are also associated with pressure ulcers' [EPUAP/NPUAP 2009].

Key words:

Pressure ulcer, Risk Assessment, Waterlow, Diabetes, Mobility

The patient was assessed for the potential of developing a pressure ulcer using the Waterlow Scale (Figure One) [Waterlow 2005]. In this article, I will evaluate whether the tool was sufficient in generating an adequate reflection of the risk to the patient, and go onto evaluate whether the tool influenced nursing interventions which served in his best interests.

The Waterlow Scale Reflects An Appropriate Risk

The Waterlow risk assessment of the gentleman in question identifies that he is at a very high risk of developing a pressure ulcer. This is the result of a presumably complex interaction between numerous factors endemic to the patient, the most significant of these being diabetes. However, does Waterlow need to consider all of these factors in order to draw an adequate conclusion?

Susceptibility to pressure ulcers increases greatly if the patient has diabetes [Liu et al. 2012]. Diabetes leads to vascular changes which predispose the skin to destructive hypoxic conditions by

majority (95%) of pressure ulcers are said to be preventable [Hibbs 1998, DoH 2010], and yet they still occur despite evidence that risk assessments significantly overstate the risks involved and hence bring about a sizeable number of unnecessary interventions [Defloor and Grypdonck 2005, Gunningberg 2005].

Is this evidence to suggest that the use of Waterlow has led to poor implementation of pressure area care? It is highly conceivable that the quality and structure of the Waterlow (and indeed any) assessment will influence the quality of the planning and implementation of the care to be provided. Do complex risk assessments therefore generate poor results? Why are many factors used if fewer highly relevant factors are chosen and consistently generate an accurate assessment? Could such a change influence the care provided?

Waterlow features a wide range of recommendations (Figure Two), so is therefore clearly aware that the assessment can influence the implementation of nursing care. Remarkably, a lack of supporting evidence detracts from many of Waterlow's key suggestions; the bulk of which relate to the use of specialised mattresses and cushions (knowingly acknowledged within EPUAP/NPUAP (2009) and NICE (2014) guidelines as relatively unproven [Reddy and Gill 2014]). Other suggestions permit the use of real sheepskin, despite being denigrated by some [Lloyd-Jones 2012], and the use of monkey poles (which to my knowledge is not permitted in many trusts due to the risk of shearing). Importantly, 'frequent changes in position', which negate the impact of immobility, appears to take a low priority, and is hidden within the bulk of the text. This issue, and complexities of the patient at-hand, imply no clear suggestions as to effective pressure area

care in this case. The value of adjusting position, even within the confines of a bed or a chair, seems to require much greater emphasis in Waterlow.

What is the evidence that a focus on only one very relevant intervention could create not only an effective risk assessment, but also positively influence the care provided? Take, for example, the idea of mobility. If you were to limit an assessment to how frequently a patient mobilises, then a succinct idea is established that a patient should mobilise in order to reduce the risk of a pressure ulcer developing. Perhaps Waterlow leads to poor outcomes because it does not offer a clear message in this way.

Only one paper (Webster et al. 2011) directly assesses Waterlow against an alternative tool (Ramstadius) which uses mobility as its only consideration. A reduction, albeit one which was not

REMEMBER TISSUE DAMAGE MAY START PRIOR TO ADMISSION, IN CASUALTY. A SEATED PATIENT IS AT RISK ASSESSMENT (See Over) IF THE PATIENT FALLS INTO ANY OF THE RISK CATEGORIES, THEN PREVENTATIVE NURSING IS REQUIRED A COMBINATION OF GOOD NURSING TECHNIQUES AND PREVENTATIVE AIDS WILL BE NECESSARY ALL ACTIONS MUST BE DOCUMENTED	
PREVENTION PRESSURE REDUCING AIDS	Skin Care
Special Mattress/beds:	General hygiene, NO rubbing, cover with an appropriate dressing
10+ Overlays or specialist foam mattresses.	
15+ Alternating pressure overlays, mattresses and bed systems	WOUND GUIDELINES
20+ Bed systems: Fluidised bead, low air loss and alternating pressure mattresses	Assessment
Note: Preventative aids cover a wide spectrum of specialist features. Efficacy should be judged, if possible, on the basis of independent evidence.	odour, exudate, measure/photograph position
Cushions:	WOUND CLASSIFICATION - EPUAP
No person should sit in a wheelchair without some form of cushioning. If nothing else is available - use the person's own pillow. (Consider infection risk)	GRADE 1
10+ 100mm foam cushion	Discolouration of intact skin not affected by light finger pressure (non-blanching erythema)
15+ Specialist Gell and/or foam cushion	This may be difficult to identify in darkly pigmented skin
20+ Specialised cushion, adjustable to individual person.	GRADE 2
Avoid plastic draw sheets, inco pads and tightly tucked in sheet/sheet covers, especially when using specialist bed and mattress overlay systems	Partial thickness skin loss or damage involving epidermis and/or dermis
Use duvet - plus vapour permeable membrane.	The pressure ulcer is superficial and presents clinically as an abrasion, blister or shallow crater
Bed clothing:	GRADE 3
	Full thickness skin loss involving damage of subcutaneous tissue but not extending to the underlying fascia
NURSING CARE	The pressure ulcer presents clinically as a deep crater with or without undermining of adjacent tissue
General	GRADE 4
HAND WASHING, frequent changes of position, repositioning, sitting. Use of pillows	Full thickness skin loss with extensive destruction and necrosis extending to underlying tissue.
Pain	Dressing Guide
Appropriate pain control	Use Local dressings formulary and/or www.worldwidewounds
Nutrition	
High protein, vitamins and minerals	
Patient Handling	
Correct lifting technique - hoists - monkey poles	
Transfer devices	
Patient Comfort Aids	
Real Sheepskin - bed cradle	
Operating Table	
Theatre/A&E Trolley	
100mm(4ins) cover plus adequate protection	
	IF TREATMENT IS REQUIRED FIRST REMOVE PRESSURE

Figure Two The List of Recommendations featured on the Waterlow Pressure Ulcer Risk Assessment Tool

significant, was found in the incidence of pressure ulcers when the Ramstadius assessment was used. However, numerous methodology issues indicate how difficult it is to reliably compare screening tools and hence depend upon such evidence.

Perhaps most pertinently, the Waterlow scale frequently appears to have been completed poorly, despite the nurses participating in the study being fully aware of their involvement and training being provided (which remained unspecified) before the research was begun. The failure to document weight in so many cases (64%) indicates that nurses often made a presumption when completing the Malnutrition Universal Screening Tool (MUST), which contributes towards the overall score. This may be indicative of wider guesswork when completing the assessment. Waterlow has been shown to be particularly prone to inaccuracies in its recording and calculation [Kelly 2005, Anthony et al. 2010], so the problem appears to be a widespread one. How can Waterlow be judged against other assessments if it is carried out so poorly?

Concurrently, a larger proportion of pressure care plans were created for patients assessed under Waterlow. This means that more patients were designated as 'at risk', but still a higher prevalence of pressure ulcers was seen. Therefore, even the interventions which followed this particular assessment were poorly implemented.

The Complexity Of Simple Risk Assessments

It is clear that Waterlow has a complex role as a clinical assessment and exerts its influence far beyond the classification of risk for a patient. For one, it has a hugely significant educational role to play [Waterlow 1985, Waterlow 1991, Anthony et al. 2008, Waterlow 2009] and this is reflected in its extensive list of potential risks and recommendations. It is often suggested that nurses like having the availability of such information to hand [Anthony et al. 2010, Brooker et al. 2011], indicating that Waterlow has implications which extend far beyond pressure area care.

However, does this make Waterlow suitable for routine screening? The enduring prevalence of pressure ulcers

suggests that a problem exists in the way that care is provided. Could this be the fault of the risk assessment itself? In relation to our patient, it is difficult to suggest that Waterlow has done much wrong. It has generated, perhaps accurately, a very high level of risk and has alerted nurses to diabetic complications and pressure ulcer intervention strategies. What it seems to lack are clear indications of what should follow, despite extensive recommendations. It could be argued that the essential care need was not fulfilled for this very reason. Although not singularly the fault of the Waterlow risk assessment, the lack of emphasis on even mobilising may have contributed towards a failure of the nursing staff to consider what could have been achieved in relation to mobility, even within the confines of his restrictions. For example, the use of physiotherapists, perhaps best placed to offer such help, was not considered.

There is reasoning behind the use of a single risk factor in a screening tool, and this recognises that the process of considering a patient holistically may not be suitable as a basis for risk assessments.

Firstly, evidence has highly implicated immobility as the fundamental cause of pressure ulcer development. Secondly, in recognising the value of one highly important aspect, and one which is highly identifiable with pressure area care, a simple, memorable message is created (that being 'let's get patients mobilising!') which may well lead to positive outcomes. To list examples, it may lead to improved compliance rates in patients (even including those not designated as 'at risk'), who may greater understand its value and share its responsibility. Indeed, it is more likely that our patient would have self-managed even minor changes in position, having perhaps greater understood the basic principle behind his foot ulcer. It may further reinforce the belief that 'prevention is better than cure' [Waterlow 1985] and hence actually enhance the overall number of interventions made, including turning or assistance to stand, as both are relatively easy to accomplish, and such effects could be widespread. For example, surgical patients are often encouraged to mobilise within a short space of time and such a message could work well here too.

Clearly, the risk posed by diabetes is

self-evident in our patient, and should not be underestimated. Perhaps a sharper emphasis on assisting individuals with mobility may help to simultaneously increase the number of skin assessments made, including areas significantly at risk due to diabetes, such as the feet. This may help to convey the message that potential pressure damage is not limited to certain areas of the body. Waterlow is notable for lacking obvious directions on checking the skin on a regular, perhaps daily basis, despite this being recommended by numerous bodies [EPUAP/NPUAP 2009, DoH 2010, NICE 2011, NHS Choices 2012].

What problems could result from the use of a single screen test? Much of this rests not only on the validity of mobility as a single risk factor, but also upon its definition. The wording has the potential to be complex and rely greatly upon clinical judgement. However, it is said that a reliance on nursing assessments de-skills nurses [Webster et al. 2010], while the perhaps excessive (and often incorrect [Defloor et al. 2005]) allocation of resources as a result of currently used risk assessments is likely to generally reduce nursing motivation in terms of pressure area care. Placing the responsibility on the nurse in such a way may thus prove in some way inspirational, as well as perhaps coincidentally limiting the frequency of unnecessary interventions.

Therefore, for example; 'Can the patient move independently in a manner which is sufficient to greatly reduce the risk of developing a pressure ulcer?'

I would suggest that in order to reduce the risk of error when using such a question that three potential options be created; 'Yes', 'Maybe' and 'No'. The latter two should inform the nurse that an action plan needs to be generated, and one which emphasises mobility as its main theme. I believe that such an assessment would require very little time to complete and enable regular reassessment. I also hope that the question posed eliminates the risk that nurses judge a patient to be at risk purely because of old age. It is likely that age and mobility are commonly associated, and may be a source of bias in any assessment associated with mobility.

Furthermore, I would hope that limiting a conveyed message to mobility does not significantly impede further pressure

area care interventions. Ironically, the idea may lead to more holistic thinking in terms of what can be done for the individual. The idea being that if sufficient mobility cannot be assured, then there are many other strategies at-hand, and these should be used appropriately to reflect the lifestyle and comorbidities of the patient. Air mattresses and barrier creams etc. are used extensively and should not be discouraged should they be necessary, but they should be secondary options. It is likely that such interventions may have been suitable for our patient.

In helping to negate such a problem enforced by a single screening tool, a dual purpose could be served. The risk assessment could also contain a list of potential risk factors and interventions,

in a similar manner to Waterlow's second page of recommendations, and I believe that if structured well, could still retain its simple focus with the solitary sub-score (see draft example, Figure Three). Such a list would continue to serve as an 'aide-memoire' and furthermore 'facilitate clinical decision making' [Waterlow 1985]. One other simple approach has been shown to work well. The SKIN bundle (the acronym partly focuses on the need to 'Keep moving') has been proven to reduce numbers of pressure ulcers across areas of the UK [Lloyd-Jones 2012].

Conclusion

What I hope to have recommended is an educational tool, incorporative of a

simple risk assessment which generates one key message, but is nonetheless informative and hence superior to clinical judgement by itself [Defloor and Grypdonck 2005, Pancorbo-Hidalgo et al. 2006]. Assessments are valuable in complex ways in leading to the implementation of care, and perhaps more would have been done for the patient had Waterlow's underlying lesson been a little more refined.

The patient had a multiple digital amputation after spending some time in hospital. I do not believe that he acquired a subsequent pressure ulcer, but this does not detract from the risks of decreased mobility. He was clearly aware of the need to change his position, having learnt from the experiences acquired from his foot ulcer.

Risk Assessment for the Development of Pressure Ulcers									
<i>'Can the patient move independently in a manner which is sufficient to greatly reduce the risk of developing a pressure ulcer?'</i>									
No / Maybe: Initiate care plan. This patient requires frequent changes in position. Check skin daily.									
Yes: Re-evaluate every three days or when a clinical change occurs.									
Date	/	/	/	/	/	/	/	/	/
Answer									
Signed									
Staff Grade									
What should be done Repositioning Good Hygiene Good Nutrition Appropriate Pain Control		Other predisposing factors which influence pressure ulcer development Malnutrition Cardiovascular Accident High Dose Steroids Smoking Multiple Sclerosis Low Albumin Urine or Faecal Incontinence Motor/Sensory Impairments Organ Failure Presence of Wounds Major Surgery Terminal Cachexia High Age Cytotoxic Medication Anti-Inflammatory Medication Peripheral Vascular Disease Anaemia Poor Quality Skin Diabetes Low or Very High Body Mass Index Female Gender							
What can be done Use of Barrier Creams Dynamic Mattress or Overlay Use of Sliding Sheets Specialised Cushions Focus on Other Predisposing Factors									
Pressure ulcer classification [EPUAP/NPUAP 2009]									
Grade One Intact skin with non-blanchable erythema of a localised area usually over a bony prominence. Discoloration of the skin, warmth, oedema, hardness or pain may also be present. Darkly pigmented skin may not have visible blanching.									
Grade Two Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open/ruptured serosanguinous filled blister.									
Grade Three Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Some slough may be present. May include undermining (wound formation beneath skin) and tunnelling.									
Grade Four Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar (dead tissue) may be present. Often includes undermining and tunnelling.									

Figure Three Draft Risk Assessment for the Development of Pressure Ulcers

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