FREE PAPER ABSTRACTS

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THE HISTORY OF CLINICAL NURSE SPECIALIST PRACTICE IN THE UK

Abstract

Introduction

As nursing has developed and its body of knowledge has grown, specialised nursing practice has evolved into a range of nursing specialisms. Clinical Nurse Specialists (CNS) were first described in the North American nursing literature in 1938, and North America has led the field in developing this area of nursing. CNS posts were created to keep expert nurses in clinical practice and to improve patient care (Sparacino, 2000), and this role for nurses has survived, despite changing health care systems.

The Growth of Clinical Nurse Specialists in the UK

Throughout the 1980s the first wound healing CNSs emerged from other posts and backgrounds, including research posts, teaching posts, ward sister posts, and community nursing posts. The number of wound healing CNSs has increased over the past twenty years. In relation to one of the sub groups of such specialists, the Tissue Viability Nurse (TVN) there is evidence of remarkable growth (Flanagan, 1997). She reports that the first TVN came into post in 1983 and up until the end of 1991 the number of these nurses appointed annually grew slowly. From 1992 on there was rapid growth. Many have made contributions to founding societies and journals; lecturing and writing textbooks and articles together; organising and presenting at conferences; running workshops; making videos; developing courses, and teaching and examining locally, nationally and internationally. Sometimes work independently, but often come together and have been instrumental in the evolution of a network of CNSs. Finnie (2002) estimates that there are currently around 400 tissue viability nurses, illustrating further growth in the numbers of CNSs in this area. Networking provides opportunities for benchmarking clinical practice and standards of care can be fed back into clinical environments and so organisations can support each other and grow together.

Education and Training

In the UK there is no mandatory requirement that CNSs be educated to Masters level (Manley, 1993). Wright (1995) argued that a more formal approach to education and training was needed, to adopt a coordinated approach by governing bodies in supporting nursing development, and that nurses are largely unprepared for the responsibilities that autonomous practice brings. With time, the need for particular training and job specifications for CNS practice have in some ways been addressed and Government strategies and bodies governing nursing now provide some guidance and support (United Kingdom Central Council, 1999a, 1999b; Department of Health, 1999). The CNS is one type of nurse working at a higher level of practice, and the United Kingdom Central Council planned to regulate such nurses, possibly through assessment of clinical skills and registration.

Professional Development

It is clear that CNSs have a secure future in the UK. Government policy, as outlined in *The NHS Plan*, (Department of Health, 2000) highlights the contribution of the nurse as becoming increasingly important in the National Health Service, one example of which is the recent emergence of consultant nurse posts. In planning career development, Kenkre and Foxcroft (2001) provide a framework for career pathways outlining the progress from registration as a general nurse, to specialist and consultant posts.

Conclusion

As specialist practice continues to develop into consultant roles, it is important that its predecessor, the CNS role also continues to thrive and develop. In the field of wound healing, in the UK, CNSs have made considerable progress. Their specialist roles have grown from generalist roles, and they made a valuable contribution, not only to improving the quality of patient care, but also to the development of nursing practice in the UK.

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CLINICAL PRACTICE BENCHMARKING, PRESSURE ULCERS: THE RESULTS AND EXPERIENCE OF A LARGE ACUTE TRUST

Abstract

Introduction

This exercise was the outcome of work undertaken in response to the commitment made in the Making a Difference document. It is a national initiative and a priority for the nursing department in the Trust to participate in the exercise. The clinical practice-benchmarking project is designed to improve quality in the fundamental aspects of care. The benchmarking process is designed in a structured way to enable sharing and comparing of practice, enabling best practice to be identified and to develop action plans for improving poor practice. The pressure ulcer benchmark is designed to identify the current quality of care and resources available to deliver best practice in a given ward. It the purpose of this presentation to present Trust results and action plans in order to share and compare standards of care with others who have undertaken this activity.

Method

In undertaking the benchmarking exercise best practice standards for pressure ulcer care have to be set and agreed. This is to enable justification for scoring. Recently national guidelines had been launched by the RCN (2000) and NICE (2001) on pressure ulcer care and prevention. Benchmarking is designed to be a qualitative process. For the purpose of this exercise, and to encapsulate the population of a large acute Trust, a quantitative data collection tool devised by the south group of the National Association of Tissue Viability Nurses was adapted for This Trusts use. The tool consisted of 4 sections:

- Nurse documentation
- An observation of patient care
- A patient/carer questionnaire
- A ward assessment

Each ward identified an individual to undertake the activity. Following a morning spent training on the benchmarking concept and how to undertake the exercise Individual wards completed the benchmark exercise in an afternoon. Reports were produced and each directorate scheduled regular meetings to discuss the results and develop action plans to modify or change current practice. Reports were produced enabling each ward to compare practice against each other.

Results

The main findings from this exercise identified a need to review the current use and planned evaluation of documentation. In many instances care was delivered as identified by the observation exercise, but this was not being reflected in the patient documentation. It was also evident that assessment and inspection timescales need to be within the six hour standard and documented accordingly. Repositioning schedules were not used in 80% of cases but where used provide a reliable indicator of the care given to a patient. Patient education was also poorly documented. Over 94.7% of patients did not have a wound assessment chart completed, however, a ‘not applicable’ box was not given for many of the question and ‘no may have been used instead. This may also be reflected in the high percentage of no results found for referral to other professionals.

Discussion

Key themes from directorate action plans:

- The development, implementation and utilisation of existing educational resources.
- To review, design and implement appropriate documentation
- To improve patient and carer education and access of patient information literature

Overall the implementation of Essence of Care has had direct benefits, to the service by raising the profile of Tissue Viability in the Trust but more importantly it has improved standards of care for patients. Evaluation and Feedback from the process has been positive and the commitment of the staff involved rewarding. The implementation of Essence of Care in such a large acute Trust demands good communication skills, coordination and the support of senior personnel in the Trust, without whom the implementation of action plans would be unachievable.

Conclusion

The benchmarking exercise is a continuum. Each directorate is now in the process or has implemented the identified actions. Plans to rebenchmark in June 2003 are underway. The results of the exercise provide a sense of satisfaction and achievement in particular for the Tissue Viability team in the development of evidence based quality patient care.

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NATURAL TREATMENTS FOR FUNGAL INFECTION OF WOUNDS

Abstract

Introduction

The most common fungal infection of chronic leg ulcers is by *Candida albicans* (13%-39%) with a higher incidence reported in occlusive dressings. Whilst *Candida albicans* is often implicated, other *Candida* species and filamentous fungi, previously considered as environmental contaminants, are increasingly being isolated and recognised as causative agents. Systemic mycoses are also important causes of mortality and morbidity in patients immunocompromised due to treatment or disease.

Anti-fungal pharamaceuticals have varying efficacy, and often, undesirable toxicity. The development of 'natural' treatments/prophylaxis would offer alternatives where such drugs are contra-indicated or refused.

Aim

To investigate *in vitro* the ability of natural health care products to inhibit fungi pathogenic in humans.

Methods

A number of fungal species pathogenic to humans, including *Candida* and *Aspergillus* species were cultured on Sabouraud Dextrose Agar (SDA). Equivalent innocula of each species were subjected to single, timed exposures to products of interest, and to suitable controls, then transferred to fresh SDA plates, sealed with gas-permeable tape, and incubated at 28^0C. The percent inhibition of the fungal species by the products was calculated using an established method, at various time intervals. In addition, Minimum Inhibitory and Minimum Fungicidal Concentrations were determined for those products showing the most anti-fungal potential.

Results

Two notable products, Molkosan (a product of fermented whey) and Spilanthes (paracress) demonstrated inhibition of *Candida albicans* and *Candida kruseii* (fluconazole resistant), as well as three *Aspergillus* species and several species associated with dermatophytosis.

Conclusions

Some of the natural medicines tested are promising candidate anti-fungal agents. *Ex vivo* studies are ongoing to further demonstrate efficacy in human tissue. Clinical trials with these products are required to fully evaluate their potential.

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TAKING GOOD WOUND PHOTOGRAPHS A GUIDE

Abstract

Introduction

The art of photography was discovered in 1839 and has been regularly practiced since 1850. However even today with the advent of new digital technology it is still a much neglected method of recording patient details. It has been demonstrated many times that the use of simple pictures can explain the detail changes that can be seen in much better ways than words can explain The use of terms such as “the wound seems redder this week” is a very subjective description. What does it mean? The aim of this discussion is to provide a few simple guide lines towards taking better images.

Methods

The common question that is often asked when considering the capture of wound images is “how can I get the best picture”. The answer is simple, take your time. However in the modern clinical setting this is always at a premium. The use of traditional film or modern digital cameras has not changed the basic knowledge required for achieving good quality informative images. Both traditional and digital photography have specific nuances that require careful consideration. Thought should be given to, why I want the photograph and how I am going to use it. In what conditions will you have to work, is for the patients records, research records, analysis. Then consideration is required as to what orientation is required, what magnification is needed, how are you going to light the wound area, the amount of reflected light, the field of view(foreground, background), the focus (and depth of focus), the speed at which your camera will capture your image, filtration, and colour balance. In many cases there is no real correct method, reproducibility being your main aim. Pictures, however captured are only a result of the reflected light that falls on the subject.

Conclusion

With careful planning and a little time, good quality images are reasonably easy to obtain, however images for analysis require a high level of reproducibility for which more effort and reproducibility is required.

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TASK TO TALKING: THE FIVE MINUTE MODEL
THE PSYCHOLOGICAL SUPPORT OF PATIENTS WITH WOUNDS

Abstract
In a growing technological world where medical and nursing interventions often alienate patients, where time spent in hospital by patients is rapidly decreasing, where patients in hospitals and the community manage their own wound care, and where litigation by patients is increasing, effective and appropriate psychological support for patients becomes ever more essential.

Earlier research found that nurses working with patients with wounds identified their patient's strong feelings but did not deal with them, heard their patient's questions but did not answer them. Time, or lack of it, was the reason given for not engaging in effective therapeutic dialogue with the patient.

In the presentation of the Task to Talking model, the author suggests that merely separating the nursing task from the time spent listening and talking to the patients can bring about major improvements in effective psychological support and the building of a therapeutic relationship, allowing the patient to be 'heard' and understood. Such improvements demonstrate strong links with the government's agenda of patient involvement in the decisions of their care.

The Task to Talking model is based on a structured, five minute interaction delivered by the nurse on completion of the nursing task, 'to give a patient the impression you could spare him an hour, and yet to make him satisfied within five minutes is an invaluable gift'.

The five minutes can be spent talking about anything the patient chooses, but it is clearly most effective if the time is spent listening to the patient's immediate concerns and anxieties.

Using a structured, timed model to give psychological support: to acknowledge and address the patient's anxieties about living with a wound encourages compliance and shortens the period of wound healing.

The model consists of six steps, the first three are core in developing the therapeutic relationship and facilitating the patient to share their thoughts, feelings, fears and concerns. Many examples of good practice drawn from psychology and counselling are given to raise awareness of the importance and value of timing, observation, listening and working with strong feelings.

The forth step allows relevant and sometimes vital information to be given to the patient in such a way that the patient can 'hear' and respond to it appropriately.

The final two steps are reflection and evaluation, which are continuous internal thought processes, undertaken by both the nurse and the patient, allowing both to individually reflect on the interaction and evaluate its overall effectiveness.

Undertaken as part of a structured interaction the model can be delivered at any point with the patient but is best used on completion of a nursing task, for example on completion of a painful or distressing wound dressing change.

Separating the nursing task from the time spent talking to the patient, promotes effective use of time and improves the quality of nurse-patient interactions in wound care and other clinical settings.

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LET A HUNDRED FLOWERS BLOSSOM: THE EVOLUTION OF A WOUND HEALING RESEARCH GROUP

Abstract
Introduction
The Wound Healing Research Sub-group is relatively new hybrid, which emerged from a Trauma and Rehabilitation Recognised Research Group (RRG). The latter group originally existed to carry out research, the aim of which is to improve the care of patients suffering from the effects of trauma or diseases of the musculoskeletal system or to discover means of preventing such trauma or disease. This group is recognised by the Research and Development Office, which is part of the Northern Ireland Health and Social Services Central Services Agency. This Office was established to promote co- ordinate and support R&D within the field of health and social care. Its remit encompasses the research needs of all sectors of health and social care within Northern Ireland including those of the Department of Health and Social Services and Public Safety.

The Wound Healing subgroup began as a seedling in September 2002. 5 members of the original Trauma and Rehabilitation RRG had a strong interest in tissue repair and regeneration. This interest did not appear to fit neatly into the themed "Outcome" sub-group as originally proposed. With great foresight, the Chair of the parent group recognised the potential for a wound-healing sub-group and so helped propagate the same. Within a short period of time the group began to grow in confidence and to attract new members.

The group manifesto is to:
- promote research at a clinical level and to unite this with laboratory studies in order to answer questions which will improve patient outcomes
- utilise the benefits of imaging techniques in wound healing research
- promote research into affordable products
- provide potential researchers in wound care with access to relevant expertise

Results
The group has blossomed and doubled in size. The CVs of the group show that is a multidisciplinary group, with nursing, medicine, physiotherapy, podiatry, dentistry, pharmacy, bioengineering, imaging and academia represented. Some members are experienced researchers, whilst others are fairly new to it. The membership also consists of 4 PhD students and one PhD applicant.

Within its first year 7 Research Projects have been developed and/or supported through education, peer review and funding. These include:
- The use of a force sensing array pressure mapping system to explore interface pressures on cushions
- A RCT comparing leg elevation with dynamic therapy mattresses in the prevention of pressure ulcers on the heels of older people with fractured hips
- The development of a generic drug delivery system for repair of lacerations in children.
- An investigation into the phenotypic differences between oral and dermal fibroblasts
- The development of a system using Electrical Impedence Spectroscopy which will allow clinicians to map wounds without removing the dressing.
- The effects of Transcutaneous Electrical Nerve Stimulation on pressure ulcers in people with multiple sclerosis.
- The development of a novel preparation to promote healing in non-healing chronic wounds.

These projects reflect the need to prevent tissue damage, investigate the effectiveness of devices and modalities, and develop novel methods to promote wound healing. In addition, one of our members has made links with other research institutions and will be involved in multicentre trials, which are seeking to investigate the effectiveness of Larvae and Ultrasound in leg ulcer management.

Discussion
The Wound Healing Sub-group has brought a diverse group of people with a common goal together. The individual researchers have benefit from the expertise within the main RRG as well as the sub-group itself. Through a cross fertilisation of ideas, this expertise has enhanced current studies and generated new research questions.

We believe that the Wound Healing Sub-group consists of a clinically focussed group of researchers looking for affordable and realistic ways of maintaining tissue integrity and improving healing rates and outcomes for patients. The group is very motivated and although we expect our members to be actively involved in research, we will continue to widen the net in the search for new and enthusiastic researchers. Most importantly, we will support them to the point where they are able to compete for funding and also help them see their studies through to fruition.

Conclusion
We are a viable plant and our aim is to continue to propagate through the promotion of clinical research, to continue to search out other researchers and potential researchers and to publish and present nationally and internationally thus contributing to and influencing clinical practice.

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BENCHMARKING THE MANAGEMENT OF MINOR WOUNDS IN ACCIDENT AND EMERGENCY DEPARTMENT

Abstract

Introduction

This project was initiated following concerns voiced by staff within the Accident and Emergency department and outpatient departments regarding the management of minor wounds in Accident and Emergency and how there was inconsistencies in practices and a lack of knowledge regarding up to date wound care products.

A focus group was developed which consisted of A/E nursing staff, practice development staff and the Tissue Viability CNS, who together agreed to formulate a benchmark for the management of minor wounds. This consists of six factors and benchmarks of best practice that cover triage, assessment, planned care, education and discharge or transfer arrangements.

After formulating this benchmark it became immediately apparent that up to date evidence based guidelines for each wound category needed compiling, these are currently being written for minor burns, human and animal bites, lacerations and grazes, digit amputations and crush injuries and pre-tibial lacerations.

Results

The wound care practices within A/E were then benchmarked by conducting a retrospective audit of 100 patients' documentation. This highlighted that the department saw over 100 patients with minor wounds in twenty four hours and that good practices existed in that the majority of patients were seen by a triage nurse and there injury was categorised according to aetiology or mechanism of injury. However inconsistencies did exist in the assessment, management and discharge arrangements of these patients and these needed addressing.

These inconsistencies were particularly evident when junior staff were documenting care and when medical staff or the emergency nurse practitioner were assessing and managing the wound, documentation was of an adequate standard although dressing choice remained inconsistent and not evidence based.

In addition, an audit of the staff educational requirements was conducted that proved that there was a deficit in wound care education amongst this staff group.

Discussion

This project has highlighted that minor wound care practices in Accident and Emergency department has often not been a priority for tissue viability services. This is possibly due to the acute nature of the wounds and that most are expected to heal without complication and also the short duration that patients stay within the acute care setting. However acute wounds are often very painful and can dramatically affect the patients' quality of life, particularly when they are poorly managed.

Conclusion

The presentation will discuss how the author has utilised the benchmarking process to standardise and improve wound care practices within the Accident and Emergency department and as the patient is transferred into the primary care trust.

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PURCHASING AND SUPPLY AND CLINICAL NETWORKS - HOW TO WIN FRIENDS AND INFLUENCE PEOPLE?

Abstract
Introduction
Gaining best value for money in clinical product and service procurement is much more likely to be achieved when purchasing and supply and clinicians work closely together. This happens in many projects and contracts but not across all, why?

There is greater empowerment of clinicians and patients following *Shifting the Balance of Power* – which means greater devolvement of decision making to the front line. Investment is being made in the NHS at unprecedented levels with the clear understanding that it is subject to the appropriate controls and demonstrates best value for money. NHS financial flows are being redirected in order to introduce payment by results and the cost of goods and services are essential elements of that process.

A key purchasing and supply role at National, and local level is to increase influence on all non-pay spend. However analysis and practical experience across purchasing and supply in the NHS has identified a major gap in effective supplies influence in significant areas of clinical spend.

Results
The current purchasing and supply agenda is influenced by the recommendations of the Audit Commission's *Review of national findings into procurement and supply in the NHS* and by the Agency's policy paper *Modernising supply in the NHS* (both documents available on the world wide web. www.pasa.doh.gov.uk)

The purchasing and supply function in the NHS has taken up the challenges within these reports and are:

- *delivering greater savings*
- *finding innovative solutions*
- *sharing commitment*
- *enhancing procurement profile*
- *increasing influence on non-pay spend*

and with most relevance to this presentation are ***involving clinicians***.

The move towards empowerment of clinicians and patients, together with the emphasis on whole health economies (working across organisational boundaries) is, in some cases, changing the nature of the procurement decision process, as well as the location of that decision. The purchasing and supply function has a major role in ensuring that all purchasing in the NHS, regardless of where or by whom it is conducted, is properly controlled and represents best value. To this end strong links have already been established with the NHS clinical procurement specialists and work continues to network across all relevant clinical groups. It is important to note that is not just trust supplies departments that are under scrutiny for best procurement practices. A considerable amount of procurement is not influenced by the supplies function but is handled directly by other departments – such as pharmacy, pathology and estates, and indeed by clinicians.

Purchasing and supply has sought to encourage the involvement of clinicians – and where possible, patients too – in the specification and evaluation of the goods and services contracted for the NHS. Two key groups for this audience are the **Pressure Area Care (PAC) Customer Consultation Group** and **Clinical Procurement Specialists (CPS) Network.**

Discussion
It is a pre-requisite for effective contracting in clinical product and service areas that purchasing and supply; clinicians and clinical networks work closely together. Understanding this has prompted questions, which have challenged purchasing and supply (and clinicians) in the NHS for many years

How do we engage clinicians?
How do we get and hold commitment?
What benefits can procurement bring to clinical activity thereby improving the patient experience?
What are the key areas of clinical activity where procurement can most effectively contribute?

These challenges were recognised at early meetings of emerging NHS supply management confederations and resulted in the establishment of the clinical networks forum one of several activity fora established to take forward the modernising supply agenda. this presentation provides details on current progress and direction to enable comment and encourage input from clinicians.

Conclusion
Better value for money will be obtained for the NHS if purchasing and supply and clinicians engage more effectively. Progress to date will be fed back but there is still a large challenge to be met.

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TISSUE VIABILITY NURSING ASSISTANT: SUPPORTING THE SERVICE (UNREGISTERED NURSING ROLE)

Abstract
Introduction
The Tissue viability Service of the Local NHS Trust, introduced the role of Nursing Assistant in November 2002. This was after a Comprehensive review of the service, which led to a successful bid for one year of monies, with which to pilot and evaluate the role.

The limitations and difficulties of the present service have assisted and supported the need for this role. These include:

- Level of workload for specialist nurse is often in excess of contracted hours, and at a consistently fast pace.
- Current day-to-day activity is often on a reactive basis, rather than a proactive approach.
- Clinical Nurse Specialist posts, are inadequately resourced in terms of administrative and clerical support, resulting in specialists spending significant amounts of time on these duties, reducing time available for clinical care.
- There is little time available for research, development and audit.
- Ability to respond to long term service developments and professional priorities has been hindered.

Method and Results
The role was introduced to provide a wide range of nursing and administrative activities. Assisting the specialist nurses in delivering high standards of care, and supporting the provision of training and development of staff and patients across the spectrum of Tissue Viability. The post holder is part of the team, operating at all times in line with the philosophy of the specialist service, and is accountable to the specialist Nurse for that particular site. Preparation and Training has been integral to the introduction of the role.

Evaluation of the role will include:

- Time analysis: allowing comparison with one site who does not at present benefit from this post
- Proactive initiatives introduced and followed through
- Quality indicators, including Pressure Ulcer Prevalence, patient information, training and staff support
- Increased audit, involvement and dissemination of ideas and processes.
- Cost Savings, following introduction of role.

Discussion and Conclusion
It is early days for this post, yet preliminary feelings and results suggest that this role has improved efficiency and quality of our Tissue Viability Service. We have also been able to realise a cost saving within the Trust. We hope to discuss the following areas in the presentation:

- Planning and funding bids
- Introduction of the role
- Practicalities
- Accountability and Training
- The impact of the role
- Future recommendations

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THE NURSE CONSULTANT IN TISSUE VIABILITY – A FRAMEWORK FOR INTEGRATION

Abstract
Nurse Consultant posts were introduced into the NHS in 2000 to contribute to improving the delivery of health care and to become integral to the delivery of the NHS plan. (DoH 2000)

Implementation of these new nursing roles in some areas has been poorly managed, often without a clear supportive infrastructure or framework in place to enhance the role and develop the services.

This presentation will describe one Tissue Viability Nurse Consultant's experience of integrating a new role not only into an NHS Trust but into a existing wound healing team.

It will explore how opportunities have been created to:

(1) Review existing services to meet patient, team and organisational needs.
(2) Initiate and evaluate new systems in the delivery of patient care within the field of Tissue Viability and Dermatology.
(3) Enhance the role of the nurse in strategic planning of services.
(4) Challenge traditional practices and cultural behaviours.

Finally, using the authors experience over the last 18 months a framework has been developed to support integration of future Nurse Consultant posts into the Trust.

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EVALUATION OF NOVEL BANDAGES FOR COMPRESSION THERAPY

Abstract
In the UK about 1% of the adult population suffers from active ulceration during their lifetime. This represents 260,000 patients in the UK of which 55,000 potential or actual ulcer patients are in Scotland alone. The total cost to the National Health Service for venous leg ulcer treatment is about £600 million per annum. It has been established that compression therapy by making use of padding and compression bandages is an efficient treatment for healing various leg ulcers, despite surgical strategies, electromagnetic therapy and intermittent pneumatic compression. In the Wounds UK 2002 conference, the performance properties of existing commercial padding bandages and the novel padding bandages, developed at Bolton Institute, were critically discussed in the Leg Ulcer Forum. In continuation of the research and development work, this paper discusses the results of the pressure distribution of developed padding and existing Type-2 short stretch as well as Type-3c high compression commercial bandages. The pressure mapping of two-layer, three-layer and four-layer systems are also highlighted.

A prototype electronic pressure profile instrument developed at Bolton institute was used to investigate the pressure mapping of two-layer, three-layer and four-layer systems. The mannequin leg simulates a lower limb and has definable tibia, calf and ankle regions. It has 8 pressure-measuring sensors of which 2 are positioned at ankle, 3 at calf and 3 at below knee. The pressure developed at ankle, calf and below knee positions in the mannequin leg was read from the display unit and the values were corrected using the regression equations.

Novel padding bandages coded as NPB5 and NPB8 were used as first layer followed by either Type 2 or Type 3a, 3b and 3c bandages. The interpretation of the results is summarised based on the following two major phenomena.

1. A sustained graduated compression, higher pressure at the ankle, which gradually reduces to calf and upper calf according to Laplace's Law[1], aids the treatment of venous leg ulcers[2].
2. Approximately 30-40 mmHg at the ankle that reduces to 15-20 mmHg (50%) at the calf is generally adequate for healing most types of venous leg ulcers[3]. The ideal pressure just below the knee is around 17 mmHg[4].

Two-Layer Bandages
The contribution of novel padding bandages (NPB5 and NPB8) in distributing sustained graduated compression is substantiated. Both NPB5 and NPB8 performed well with Type 2 and Type 3c bandages.

There is not much difference in pressure distribution characteristics of NPB5 in conjunction with Type 2 and Type 3c bandages. However NPB 8 performed better with Type 2 than with Type 3c.

The Type 2 with NPB8 bandage system seems to fulfil the requirements of around 40 mmHg at the ankle, graduating down to about 17 mmHg just below the knee.

The ankle pressure exerted by Type 2 with NPB5 system is high, although the pressure is graduating down to the knee.

Three and Four Layers Bandages
There are conflicting trends in graduated compression profile between two-layer system and three or four-layer system. The pressure registered at ankle, calf and knee is always high in both three-layer and four-layer systems when both NPB5 and NPB8 are involved.

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DEVELOPMENT OF A VASCULAR ASSESSMENT CLINIC, INCORPORATING A LEG ULCER CLINIC, USING TELEMEDICINE, IN A DIAGNOSTIC AND TREATMENT CENTRE

Abstract

Introduction

I trained as a District Nurse, Community Practice Teacher and worked part time as a Leg Ulcer Advisor before moving into a Wound Care Specialist Post for North Hampshire Primary Care Trust. I felt frustrated at the delay in obtaining accurate vascular investigations within secondary care, so the idea of developing a clinic within a Diagnostic and Treatment Centre (DTC) seemed an ideal prospect. A DTC is designed to deliver additional high quality, cost effective, scheduled diagnostic and treatment services which optimise clinical outcomes and maximise patient, carer and staff satisfaction.

Prior to September, 2002, patients living within the North Hampshire area were seen by either their practice nurse at the doctors surgery or by the community nurse at home. Patients requiring vascular assessment were sent to a choice of three hospitals – all with considerable travelling distance and delay.

The aim for this new centre was to provide:

a) specialised treatment for patients suffering with leg ulcers, providing equality for all
b) early diagnoses of vascular conditions, resulting in only appropriate referral to secondary care
c) accurate electronic recording of assessment, treatment plans, wound photography, healing graphs, using telemedicine

Results

We completed an audit of the first six months in February 2003. We saw a total of 226 patients of which 55 were new contacts. 23 were for vascular assessment only. Out of these 23, 6 were referred for a consultant's opinion and 17 required no further intervention. Waiting times were at 14.8 days on average. Ulcer duration ranged from 22 years to two weeks. Out of the 32 patients assessed with leg ulcers, 25 were referred on to either a: varicose vein specialist, vascular consultant, dermatology consultant and/or orthotic department. Healing rates were difficult to measure, as some patients were assessed only, and then discharged back to the practice nurse or district nurse. There was a poor response to the patient satisfaction survey, but 6 out of 7 (86%) rated the overall visit and treatment as very good.

Discussion

It has been exciting to be able to provide care in this setting. Vascular assessment may have saved a potential of 17 referrals to a consultant. Many difficult wounds, the longest duration being 22 years, are now beginning to heal. Emphasis has been placed on patient education, encouraging concordance by instilling confidence with a professional and friendly approach and ensuring patient understanding of the reasons for their treatment. Different compression systems are used, depending on the patient's life style and preference.

We have changed our way of treating leg ulcers. Historically, we had been completing a holistic assessment, including Doppler ultrasound, and treating as appropriate. If the wound fails to heal after 8 weeks, the patient was then referred to secondary care for further investigations. Superficial treatable venous disease was often not diagnosed or treated. Assessment records were stored on paper sheets, often difficult to read and communication was difficult between different disciplines.

We believe that optimal management requires a multidisciplinary approach with contributions from both the DTC and hospital specialists, to identify, investigate and treat the underlying cause. Within the DTC, we can investigate using arterial waveforms and pressures, pulseoximtry and venous photoplethysmography PPG). Arterial waveforms give a printable reading, which can be forwarded, to a consultant as appropriate. Pulsoximtry allows us to compress safely at lower APBI, although research is still limited. PPG is used to assess venous disease, in particular long and short saphenous vein valve incompetence. Immediate referral is then made for a consultant's opinion and treatment of the underlying condition. This explains the high number of referrals (78%). Documentation, as from January, is stored electronically.

Conclusion

As many other authors have written and proved, treatment of leg ulcers in a clinic is cost effective and there is an improvement in healing rates and quality of life. We have gone one step further with identification and treatment of the underlying cause. Accurate record keeping, using telemedicine, is proving invaluable due to its high levels of accuracy. The Primary Care Trust, within the DTC, is now in the process of applying for funding to perform duplex scans on all patients within 1 month of presenting with a leg ulcer,. Treatment of venous incompetence will be done using sclerotherapy when appropriate.

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THE TISSUE VIABILITY ASPECTS OF WEARING HIP PROTECTORS

ABSTRACT

INTRODUCTION

Falls resulting in fracture of the hip in elderly people are a major health problem worldwide. These fractures can result in high risk of long term care requirement, morbidity and disability, and an increased risk of premature death. In the United Kingdom the average cost of a hip fracture is estimated to be £15,000. With over 70,000 hip fractures per year, the total annual cost is over £1bn in the UK. When these costs are compared with the cost of hip protection, approximately 500/person/year, external hip protection becomes a very good cost effective option as a method of preventing hip fractures in the elderly.

The current designs of hip protectors incorporate either a hard thin preformed shell within a softer layered material, a preformed hard shell alone, or a single flat sheet of soft shock absorbing foam. These are held in position by a garment which is suppose to keep the pad in the right location with respect to the part of the hip (the greater trochanter) which is just below the surface of the skin.

There have been no studies on the tissue viability issues of wearing hip protectors either in a garment or attached to the skin. Misplacement, and conformity with the skin could give rise to large oblique and shear forces and high interface pressures on the skin over the greater trochanter. This area is known to be susceptible to damage, especially in the frail elderly that may need hip protectors. This study undertook to investigate the effect of shape and misplacement on the interface conditions under likely physiological loads over a model of the area of the greater trochanter, and to assess the protection to the soft tissue of various designs in use.

Methods

Shape data was obtained by outlining the surface profile in the sagittal and horizontal planes centred on the greater trochanter of twenty elderly women admitted for a fracture of the contralateral side. An average shape was established and compared with the horizontal section of four commercially produced hip protectors to ascertain the amount of shape conformity and contact with the surface of the skin around the greater trochanter. A pressure pad was used to measure the extent, shape and values of the contact pressure of subjects lying on their side. An Oxford Pressure Monitor was used with a single cell mounted on the greater trochanter to ascertain the interface pressure whilst lying directly on the hip protector to simulate a sleeping position. The position of the greater trochanter relative to the skin was measured at various angles of hip flexion using a SafeHip garment with a hole in the centre of the pad. The effect of misplacement of 4 commercially available pads on the interface pressures and coverage of the greater trochanter was measured.

Results

Designs incorporating a hard shell surrounded with a shock absorbing layer could, in certain positions, be in contact with the skin over the greater trochanter and nowhere else, with little distribution of the contact pressure away from this area. Hard shell designs could have small areas of contact in women with prominent bony areas during lying. Small elliptical areas areas with high interface pressures (Greater than 120 mmHg) could be observed on subjects lying on their side.

The skin over the greater trochanter can be displaced by as much as 5 cms at 60 degrees of hip flexion, which reflects a position whilst sleeping, and whilst impacting the ground during a fall. With some designs which were misplaced or had moved away from the centre of the greater trochanter when the hip is flexed, the interface pressure measurements could be as high as 120 mmHg and in one design the edge of the pad was directly sited over the bony prominence of the greater trochanter.

Discussion

Correctly positioned hip protectors need to be conforming with the skin around the greater trochanter, but some hard shell designs are sufficiently flat on highly curved areas around the lateral hip that direct contact with the greater trochanter could occur and the skin over the greater trochanter becomes highly compromised. As a consequence, the shape of hip protectors, their position, and design related to function needs to be addressed to reflect the clinically important tissue viability aspects. Some designs may prove to be dangerous in use both whilst lying on them at night with high pressures for long periods of time, or provide a lack of protection and consequent tissue damage from a fall.

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AN IMPROVING TREND: VENOUS ULCER HEALING RATES WITHIN TOWER HAMLETS PRIMARY CARE TRUST

Abstract

Introduction

This paper presents the results of the 2002 audit of venous ulcer healing rates within Tower Hamlets Primary Care Trust. The trust's standard for leg ulcer assessment, documentation and referral pathways is the Leg Ulcer Care Programme, introduced in 1998 and revised 2002. This audit reviewed the data for the clients on this programme and the healing rates for venous and traumatic ulceration, for whom compression therapy would be the preferred treatment. All audited clients were managed by District Nurses. Comparison is made with the previous audit of 2000.

Data collection

All district nursing notes were reviewed for clients who fell into one of two categories: Data was obtained on all those who had active ulcers of any aetiology and the healing rates for venous, mixed and traumatic ulceration was collected. Data was also collected on clients who were on the venous ulcer prevention programme.

Results

There are 73 clients with active ulceration: age range 25-97 years (median 78 years) with 22% having bilateral ulceration (52% in 2000). Venous ulceration accounts for 56%, with 54% of these having recurrence of previous ulceration (83% of the latter were on the DN caseload for prevention management). A variety of compression bandages or systems are utilised with multilayer and single layer bandages used equally, except for inelastic bandages which were used by only one client. 67% of clients are seen at home, the remainder in dressing or dedicated leg ulcer clinics. There is evidence of good referral to specialist services, but this could improve for those with arterial disease. Arterial ulceration accounted for 12% of patients.

There are 113 clients on the prevention of venous ulcer programme: age range 44-93 years (median 75 years). 32% of clients on the prevention programme have not had ulceration before. In addition 33% had remained healed for > 18 months. 78% of clients had been fitted with hosiery. However, unresolved eczema remains an issue that demands resources and nursing time.

Compression therapy is used for those with venous ulceration, mixed venous/arterial disease and traumatic ulcers. Venous ulcer healing rates (inclusive of mixed and traumatic ulceration) continue to improve: 53% healing at 12 weeks, 66% at 24 weeks, 81% at 52 weeks (41%, 63% and 85% in 2000).

Discussion

There is a steady trend in improved management of clients who have or who are at risk of leg ulceration. There is evidence of an increase in primary preventative work since the 2000 audit. Importantly, for those for whom compression therapy is an option, the outcomes are good. When compared with other studies, these results are favourable especially as the population comprises of both mobile and immobile patients, and the healing rate data includes those with mixed disease. These results reveal the impact of clinical guidelines, standardised care, education and access to a specialist service. Unfortunately, due to audit error, there was missing data from a proportion of clients regarding fixed ankle and hosiery information. Compression therapy is used extensively within the trust but inelastic bandages need to be encouraged.

Conclusion

The district nurses, within the supportive and educational framework offered by a clinical nurse specialist team, can effectively manage leg ulcer care within primary care. Clarity of referral pathways ensure that delays in diagnosis are prevented and when required, referrals for specialist advice are prompt. For complex or non-healing wounds, patients and staff have access to a multidisciplinary team and in-patient beds within a dedicated wound healing unit, the East London Wound Healing Unit. In addition, the latter unit runs a complex hosiery clinic to enable the increase in hosiery usage. Thus Tower Hamlets Primary Care Trust provides an effective service to those with or at risk of leg ulceration. This paper will demonstrate the detailed results of this audit and where improvements are required.

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AN EVALUATION OF THE VITAFOAM REFLEXION STANDARD WHEELCHAIR CUSHION IN TWO WHEELCHAIR SERVICES

Abstract

Introduction

Evaluating pressure redistributing wheelchair cushions in a clinical setting is complex, because in addition to the issues of success or otherwise of the product with regard to pressure redistribution, other equally important issues must be taken into account. These include the postural support offered by the cushion, as this will impact on its ability to redistribute pressure and promote function, and the client's perception of comfort.

The Vitafoam Reflexion Standard Wheelchair Cushion is constructed from visco-elastic foam. A key feature of visco-elastic foam is that it is slow to react following application of a force and will not quickly regain its original shape, as will conventional high resilience foams. This has benefits in pressure ulcer prevention, as the foam will conform to the body's shape, providing a viscoelastic 'flow' around bony prominences, thereby redistributing pressure.

The evaluation of the Vitafoam Reflexion Standard Wheelchair Cushion aimed to ascertain:

- Whether the cushion prevented the development of pressure ulcers
- Whether the cushion promoted suitable sitting posture
- How comfortable the cushion was
- The type of client who would most benefit from using the cushion
- How user-friendly the cushion was

Method

Two Wheelchair Services in England were each asked to evaluate 10 Standard Wheelchair Cushions with clients who were at risk of pressure ulcers, over a 6 week period. A questionnaire was completed by the wheelchair therapist during the initial assessment, when the cushion was prescribed. A follow-up questionnaire was completed 6 weeks later, to determine the success or otherwise of the cushion.

Results

Initial Questionnaire

The reason for prescription fell into three categories: people who were uncomfortable on their existing cushion, who were at risk of pressure ulcer development or who required initial assessment. Over 50% of clients spent all day sitting in their wheelchair. 11 clients were noted to have minor postural problems during the initial assessment. The average Waterlow Risk Assessment Score was 20 and the scores ranged from 14 – 28.

Follow-up Questionnaire

Of the 20 clients who entered the evaluation two were withdrawn from the evaluation, one due to development of a grade 1 pressure ulcer and another due to admission to hospital. 1 client failed to return his questionnaire. Results therefore refer to the remaining 17 clients. Clients were asked to rate the comfort of the cushions on a score of 1-10, with 1 being extremely uncomfortable and 10 being extremely comfortable. All clients indicated that the cushion was comfortable, with most of the clients scoring the cushion between 8-10. No client scored the cushion with less than 5. The majority of clients responded that the cushion had made no difference to their posture, although three reported an improvement in comfort. One client reported deterioration in his posture.

Discussion

These results are encouraging; particularly considering that the cushion is linear, theoretically offering minimal aggressive positioning. For clients with more complex postural needs, it would be appropriate to use alternative cushions in the Reflexion Wheelchair Cushion range. However, one has to place the results in context in that only 20 clients evaluated the cushion.

Three main benefits of the cushion have been highlighted by the evaluation. The cushion seems to be effective in preventing pressure ulcer development in high and very high risk users, many of whom sat for long periods of time. None of the clients reported that the cushion was uncomfortable and most reported that the cushion was very comfortable. Achieving seated comfort for clients is always a challenge for therapists due to the length of time that their clients are expected to sit and also the anatomical design of the body. Due to the shape of the cushion, results which suggest that posture could be improved were not expected. However, whilst one client did report deterioration in his posture a further six reported improvement in their posture or improvement in the comfort of their posture. These results were surprising and heartening, suggesting that the Reflexion Standard Wheelchair Cushion can offer sitting stability and promote symmetrical posture in addition to comfort and pressure reduction.

Conclusion

The comments received on the Vitafoam Reflexion Standard Wheelchair Cushion are extremely positive, both in terms of pressure ulcer prevention, particularly in such a high risk group, and in terms of comfort. Of specific interest was the influence of the cushion on client's posture. This positive outcome was unexpected, particularly since the cushion was linear. This potential benefit is enhanced by the other cushions in the Vitafoam Reflexion range which are contoured.

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WEB-BASED INFORMATION: A 17 MONTH EVALUTION OF ENQUIRIES SUBMITTED TO A SPECIALIST WOUND RESEARCH UNIT (UK)

Abstract
Introduction
The Internet has become increasingly popular as a source of information for individuals seeking advice on health matters (Diaz et al 2002, Todd et al 2003). It is also a vehicle for health care professionals to gain further information on many aspects of health care provision, education and research.

An evaluation of website enquiries to a specialist wound research unit was undertaken for the period beginning December 2001 to the end of May 2003, the aim being to establish the number and type of enquiry submitted, i.e. clinical advice, health care information or requests for educational courses. The nationality of the individual logging the enquiry was also collated to look at how far geographically the website was being accessed.

Enquiries to the website were dealt with by the appropriate professional in the Unit to ensure accurate and relevant information was given i.e. clinical advice, research or education. A standard response for clinical enquiries was devised to acknowledge the concerns of the patient but to suggest they should discuss this with the health care professional caring for the them. Opportunities to access further information were made available through links to other websites.

Results
A total of 285 enquiries were logged for the 17-month period, 65% (n=187) were from females and 66% (n=188) were submitted from the UK. The majority of individuals (30%, n=86) requested information on the educational courses run, specifically the Masters / Post-Graduate Diploma in Wound Healing and Tissue Repair. General requests for information accounted for 29% (n=84) and were logged by both health care professionals and 'lay-people'. The highest percentage of clinical advice sought was for non-healing pilonidal sinus disease (15%, n=41).

Discussion
Internet based information is available to a much wider population world-wide. Research units such as this one need to be mindful that having a website opens up access to many individuals. This requires two aspects; to be able to act as a source of information and deal professionally with clinical enquiries. In terms of development of the website, ongoing evaluations will continue to ensure that the information provided is targeting the right audience.

Conclusion
The World Wide Web is utilised as a source of medical, health and educational information. Functioning as a specialist research unit with a website offering the opportunity for individuals to submit enquiries, requires provision of up-to-date, relevant information and more importantly the ability to direct the patient seeking specific clinical advice to the health care professional responsible for their care. It is important to include links to appropriate web based health information resources for patients and clinical colleagues.

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NON-HYPERPARATHYROID WOUND CALCIFICATIONS: TWO CASE PRESENTATIONS AND LITERATURE REVIEW

Abstract
Two case studies in which subcutaneous tissue calcifications are found with normal serum calcium levels are reported in detail. Treatment in both cases included aggressive surgical debridement of calcium deposits. Though the etiologies differ, the two patients had similar symptoms and pathologic findings A review of the literature reveals several etiologies of cutaneous and subcutaneous calcification. Physiologic regulation of body calcium is discussed as well as diagnostic tools and treatment plans.

Introduction
Subcutaneous calcification has been well described in medical literature as a complication of chronic venous insufficiency. Other occurrences of such calcifications have been noted due to causes that are not well understood. Regardless of the etiology, the presence of calcium deposits in soft tissues may lead to chronic wounds that do not respond to conservative therapy. For healing to occur it is well established that the solid calcific deposits and surrounding devitalized tissue must be removed from the wound sites. The mechanism for non-healing is thought to be similar to that of a foreign body reaction caused by calcified tissue leading to chronic inflammation that does not allow granulation tissue to form.

The following cases represent different etiologies contributing to subcutaneous wound calcification. One patient represents a case in which chronic venous insufficiency and or trauma may have been the cause of calcifications. The other case represents a patient who had wound calcifications that were idiopathic in nature. Regardless of the etiology the mechanism of dystrophic calcifications is not well understood. Both cases represent patients who underwent surgical removal of the calcific deposits to allow proper wound healing.

Case Report One
A 75 year-old white female was seen at the Wound Healing Institute in July of 1998 with a non-healing wound on the right leg present for greater than 1 month. This patient underwent an incision and drainage of an abscess on her right leg performed at bedside approximately one month prior eventually resulting in a dehisced wound with serous drainage. The patient denied nausea, vomiting, or shortness of breath. This patient had a history of diabetes x 10 years, hypertension x 28 years, and a motor vehicle accident 13 years ago complicated by chronic pain and difficulty ambulating from multiple surgeries of the lower extremity including closed reduction and skin graft to the left heel. There is a history of venous stasis disease for an unknown length of time. The patient denied any numbness or tingling in either lower extremity. She had been taking Diabinese 1.25 mg daily for her diabetes, Norvasc 7.5 mg and Cardura 4 mg for her hypertension. Other medications included Daypro, Neurontin, Lortab, and Persantine. The patient denied tobacco, alcohol, or ilicit drug use, and related drinking 7 cups of coffee per week x 50 years.

Physical examination revealed an alert and cooperative obese patient in no acute respiratory distress. BP 168/83, P 94, R 20, afebrile. The patient complained of diffuse pain throughout the body including headache, back pain, abdominal pain, and leg cramps. There was no evidence of wheezing with clear lungs bilaterally. A cardiac exam revealed regular rate and rhythm without gallops. An extremity exam revealed +3 edema of the right lower extremity with mild hair growth and warm temperature. The right lateral leg wound measured 9 x 23 x 21mm with 24mm of undermining at 12 o'clock. A vascular exam of right leg revealed a +2 popliteal, dorsalis pedis, and posterior tibial pulses. Capillary refill was immediate. Reflexes were intact without a decrease in proprioceptive or vibratory sensation.

Wound cultures revealed few gram-positive cocci. X-ray of the right leg revealed multiple soft tissue calcifications with soft tissue swelling. There was evidence of a healed fibular mid-shaft fracture. A blood count showed mild anemia with a RBC of 3.98, HGB of 11.6, and HCT of 35.4. Sedimentation rate was 77mm.

After continuous local wound care, including Nu-gauze wet to moist pickings, and oral antibiotics; no improvement was noted at the wound site and the patient was taken to the operating room for irrigation and drainage of the right leg wound. In the operating room large calcific deposits at the proximal portion of the wound were noted. At least eight separate islands of calcific deposits were removed from the wound with expressed pus as well. The calcific deposits were sent to pathology for further evaluation and cultures were taken of the purulent material. The distal portion of the wound was closed and the proximal wound was left open and packed. The pathology report revealed dense fibrosis, acute inflammation, focal necrosis, and calcification. Wound cultures returned as Staphylococcus epidermidis resistant to oxacillin. The patient was continually followed and treated with local wound care and compression stockings for her venous stasis disease. During treatment at the Wound Healing Institute more calcific material was removed from the wound on numerous occasions and sent to pathology. The pathology report returned with a diagnosis of focally calcified, dense, amorphous material. The patient was taken to the OR in December for primary closure of the wound with excellent results.

Case Report Two
An 84 year-old white female presents to the Wound Healing Institute from her nursing home residence with a non-healing wound involving her left medial lower leg. The wound measured 8 x 10 x 3mm with extensive subepidermal calcification and calcium deposits extruding from the wound. This had been present for approximately 4-5 years. The patient denied nausea, vomiting, or shortness of breath. The patient had a history of hypertension and urinary tract infections and has had no history of diabetes or tuberculosis. The patient is was taking multivitamins, Zinc sulfate, Hydrochlorothiazide, Metoprolol, Colace, Vitamin C, Lactate, Pepcid, Benadryl, and Tylenol. The patient denied any use of ethanol or tobacco, but related drinking coffee occasionally. The patient had a history of anemia.

Physical examination revealed an alert and cooperative patient with vital signs of T 97, P 64, R 20, and BP 120/72. Lungs were clear to auscultation and percussion bilaterally. Cardiac exam revealed regular rhythm with a grade 3/6 systolic murmur. ECG showed sinus rhythm with ST changes in the lateral leads. A lower extremity vascular examination revealed palpable popliteal, dorsalis pedis, and posterior tibial pulses with immediate capillary refill. Skin examination showed minimal hair growth with mild lymphedema and multiple varicosities noted. The wound site measured 8 x 10 x 3mm in dimension with extensive subepidermal calcification radiating from the wound site.

Wound cultures revealed rare Pseudomonas aeruginosa and Staphylococcus aureus. X-ray of the left leg revealed extensive soft tissue calcifications and ossification overlying the distal tibia and fibula as well as posterior to the distal femur with no fracture or focal bone destruction noted. Biopsy of the wound showed granulation tissue with areas of necrosis, severe acute inflammation, and focal calcium deposition. PT and PTT were within normal limits. The patient was slightly anemic with hemoglobin levels of 9.5 and MCV at 99. The SMA- 7 was within normal limits.

The patient underwent local wound care with antibiotic therapy and was taken to the OR for resection of calcific deposits to allow wound healing. In the OR, segments of calcific deposits were removed from the wound bed down to the fascial level. Pathologic examination of the deposits revealed fragments of necrotic bone and soft tissue. Wound cultures were also taken at this time and showed moderate white blood cells with few gram positive cocci with culture results returning Staphylococcus aureus. The wound, appearing free of any calcifications, was covered with a cadeveric allograft. Upon the first postoperative visit, the graft site had a green exudate and appeared infected. At that time the allograft and exudate were removed from the wound at and allowed to granulate. The proximal portion of the wound again showed a significant amount of subcutaneous calcific deposits, which were removed at the Wound Healing Institute.

Local wound care including wet to moist dressings significantly decreased the size of the initial wound but new peri-wound excoriations were noted with the etiology unknown. These wounds eventually formed a solitary wound measuring 20 x 24 x 1mm with a clean granulatory base. Over the next few months more subcutaneous calcifications were noted with multiple areas of chronic hypertrophic granulation tissue and non-healing wounds about the area. She was advised to have further surgery that she refused. She returned for weekly and then monthly visits without closure of the wounds and eventually never returned.

Discussion

A review of the literature suggests that dystrophic wound calcification is a topic that is currently not well understood. Dystrophic calcifications have been seen in a variety of clinical settings including chronic venous insufficiency, areas of trauma, osteomyelitis, and areas of infarcts.

Calcium is a divalent cation that in humans presents in many forms with a variety of physiologic functions. Only 10% of total body calcium is soluble and present in extra and intracellular fluid, with the remaining 90% present as crystaline substances such as hydroxyapatite. Of the bodies 10% of soluble calcium 50% is biologically active with the remaining 50% being bound to albumin or complexed with other anions.

The parathyroid hormone and 1,25 (OH) 2D3 tightly regulate serum calcium. Parathyroid hormone is a single chain polypeptide synthesized in the parathyroid glands. It is secreted in an active form and is inactivated in peripheral circulation. An inverse relation exists between extracellular calcium concentration and parathyroid hormone secretion. Increased calcium plasma concentration is caused by increased parathyroid hormone concentration by its direct effects on bone and kidneys and by its indirect effects on the intestine. Conversely an increase in the serum concentration of ionized calcium results in a decrease in parathyroid hormone production. 1,25(OH)2D3, or the active form of Vitamin D3, is produced in the liver and kidney from inactive Vitamin D3. 1,25(OH)2D3, like parathyroid hormone; increases plasma calcium levels. Unlike parathyroid hormone, its primary action is to stimulate active calcium transport across the small intestine via an electrochemical gradient. The exact mechanism in which 1,25(OH)2D3 stimulates the accumulation of calcium in the intestinal cell is unknown.

Despite tight regulation of serum calcium, subcutaneous or cutaneous tissue calcification may occur. Cutaneous tissue calcification or calcinosis cutis is a common occurrence associated with chronic venous stasis, but can be caused by several mechanisms. The causes of cutaneous calcifications are generally divided into categories based on etiology. These include dystrophic, metastatic, idiopathic, and iatrogenic causes.

Subcutaneous tissue calcifications may also present as dystrophic calcification in the form of venous stasis disease, collagen vascular diseases, neoplasms, panniculitis, certain inherited disorders, trauma, and some infections. Idiopathic calcification occurs without abnormal calcium and/or phosphate metabolism or obvious underlying tissue abnormalities.

Cutaneous ossification involves membranous and enchondral bone formation in the skin. This condition may be seen in areas surrounding neoplasms, in calcified tissue, in inflammatory and metabolic diseases, and infrequently in normal tissue. In all cases the pathogenesis of cutaneous ossification remains unknown.

The first case presented is an example of subcutaneous wound calcification in a patient with a history of trauma as well as chronic venous insufficiency. In this patient mineral deposition was limited to the subcutaneous tissues with sparing of the skin, fascial, and muscle layers.

The second case is a scenario in which calcium was frankly extruded from the wound. This presentation is unusual, but reiterates the importance of looking for such calcifications. This case represents the idiopathic nature in which some wound calcifications form.

Differentiating subcutaneous calcification from subcutaneous ossification cannot be made by gross visualization of the wound or wound deposits. Use of radiographs is only somewhat helpful in making the distinction. Histopathologic evaluation of the deposits is the only conclusive way to differentiate the two types of wound deposits. Calcified tissue is commonly seen with osseous deposits at the time of biopsy. It is believed that calcification is necessary as a precursor to ossification. It is a common occurrence to see calcium deposits in conjunction with osseous tissue. The mechanism of formation of such material is not well understood. It is interesting to note that virtually any process that calcifies may secondarily ossify, but primary ossification is a rare occurrence.

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AN EVALUATION OF THE IMPACT OF AN EDUCATIONAL INITIATIVE IN DIABETIC FOOT MANAGEMENT

Abstract

Introduction

The Diabetic Foot project commenced with the aim of developing, implementing and evaluating a training package for community nurses and podiatrists in the management of the diabetic foot. Through the provision of 2 study days, and newly developed training materials 56 nurses and 25 podiatrists took part in the initiative. The research was a joint venture between what was then North Sefton and West Lancashire Community Trust and Edge Hill College of Higher Education. It was envisaged that by having joint study days between nurses and podiatrists there would be improved collaboration between health care professionals involved with diabetes care.

It is believed that around 2% of the UK population have diabetes, of whom perhaps 200,000 have Type 1 diabetes and more than a million have Type 2 diabetes (Calman 1998). The Trust in which the research took place has a high population of older adults, 2% above the national average (Census 1991); consequently the proportion of people with diabetes is also high, 3% above the national average (Stott et al 2001). Ulceration of the foot is estimated to affect 15% of people with diabetes at some time in their life (Holewski et al 1989; Griffiths & Wieman 1990; Apelqvist et al 1992; Steed et al 1995). Foot ulceration remains one of the most prevalent and serious complications associated with diabetes (Sims et al 1988; Currie et al 1998).

The care and management of patients with diabetes provides a continuing challenge to Health Service resources and the professionals that work within it due to the complexity of the disease and its multiple complications (Frykberg 1997). It is now widely recognized that in order to maximize the care a patient with foot ulcers receives it is essentia
Thompson et al 1991; Middleton et al 1995; Knowles et al 1996). Howie (2002) suggests that each discipline affords their own perspective to an area of care, which can only enhance the ultimate care delivered to the patient.

The aim of the study was to evaluate the impact of two days training on the knowledge and reported practice of nurses and podiatrists in the management of the diabetic foot. The study utilised a two-group pre/post test design, and replicated the work of Luker & Kenrick (1993) and Nelson & Jones (1997), which examined nurses' knowledge and reported practice. A total of 56 nurses and 25 podiatrists were involved in the study, randomly allocated to control and experimental groups. The instruments were designed to facilitate the computation of a 'knowledge score' (knowledge and reported practice), with changes across the variable from pre to post test providing the basis of the efficacy of the training.

Results

The Wilcoxon Signed Ranks was used to determine if there was a difference between the experimental and control group scores. The increase in scores across all dimensions of the instrument from pre-test to post-test for the experimental group was highly significant. The scores in the control group at post-test hardly changed at all.

Discussion

The results reported demonstrate the positive effect of two study days on practitioners' knowledge and reported practice. Although there was an improvement in score for the experimental group at post-test, the post-test score still indicated that there were considerable gaps and variation in the delivery of care.

Conclusion

This study has highlighted the potential to improve practitioners' knowledge and reported practice in the management of the diabetic foot through the provision of 2 study days. Collaborative study was viewed as being valuable by the two professional groups who participated in this project.

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ACTICOAT *7 (WITH NANOCRYSTALLINE SILVER) AND THE MANAGEMENT OF DIABETIC FOOT ULCERATION

Abstract

Introduction

The effacacy of silver and it's related compounds as antimicrobial agents has been recognised for many years. Modern day delivery systems provide topical cover for a broad spectrum of bacteria and are rarely associated with microbial resistance. Acticoat*7, a nanocrystalline silver coated antimicrobial barrier dressing was used in the management of diabetic foot ulceration. Clinicians involved in diabetic foot ulcer management strive to provide care via optimal glycaemic control, management of peripheral vascular disease, eradication of infection, appropriate sharp debridement of the wound edges and base, application of a suitable dressing regimen, off loading in the neuropathic foot and ongoing education to patients and their carers.

Methods

7 patients attending the Podiatry Clinic for chronic diabetic foot ulcer management were treated using good standard wound care as described above. All patients had Acticoat*7, plus a secondary dressing, applied to a variety of wounds and their outcomes monitored. Data was also collected on patient's age, duration of diabetes (years), the presence of peripheral neuropathy and peripheral vascular disease, the duration of the ulceration prior to treatment with Acticoat*7 (weeks), the site of the ulcer, the duration of treatment with the dressing regimen (weeks), the type of secondary dressing used, treatment with oral antibiotic therapy during the treatment period as described, x ray results, and offloading techniques. Swabs were done only on wounds which presented with clinical infection. All patients were reviewed at least weekly.

Results

7 patients (6 male and 1 female) were included in this case series. The mean age was 58.4 years (female aged 50 years) with a mean diabetes duration of 29.4 years. All patients presented with peripheral neuropathy, 6 had evidence of artery calcification by raised or untestable ankle brachial pressure indicies and 2 patients had significant peripheral vascular disease, 1 with necrosis. In all patients ulceration had been present prior to this episode of care for 2-102 weeks (mean 37.7 weeks). 4 patients (57.1%) had ulceration for 2, 11, 12 and 13 weeks, and 3 patients (42.8%) had ulceration 52, 72 and 102 weeks. 4 patients (57.1%) presented with ulcers on the plantar surface of the foot, 2 (28.5%) had ulceration on a digit, one of which was necrotic, and 1 patient had ulceration affecting the heel. During this episode of care patients' ulcers were treated for 1-42 weeks (mean 12 weeks) with Acticoat*7 plus a secondary dressing. In 5 patients the Acticoat*7 was covered with and alginate dressing plus sterile gauze and in the remaining 2 patients, an alginate plus a polyeurathane foam. 2 of the 7 patients (28.5%) continued on oral antibiotic therapy during the treatment episode. 2 patients had serial plain x ray films performed. Off loading was achieved by total contact casting (1), crutches (1), bespoke shoes and orthoses (2),2 cases involved digits and were not off loaded and the female patient wore trainer footwear. 2 patients (28.5%) achieved complete wound closure, 2 (28.5%) patients improved initially but then deteriorated, 3 (42.8%) patients are receiving on going care with Acticoat*7 and are improving.

Discussion and Conclusions

The patients described in this small case series have had chronic limb threatening ulceration for months and years and are at high risk of amputation. One patient, whose wound closed, felt that he would have a below knee amputation regardless of what treatment was provided. He remains healed and has a much better quality of life. The second patient achieving closure is a young man who is now able to hold down a job. In the 2 patients who deteriorated one had an underlying osteomyelitis and care is ongoing, whilst the second patient has again improved, infection is managed and the wound is almost closed. The female patient with the heel ulcer and one male with digital ulceration remains active, The male patient has stopped his oral triple antibiotic treatment and it is anticipated that closure can be achieved. Digital necrosis is present in 1 patient. It is hoped that this digit will auto amputate sucessfully if the demarkation line can be kept infection free with this dressing regimen. In conclusion, diabetic foot ulceration is both difficult and complex to manage. Increased bacterial resistance to antibiotic therapies is a concern and topical antimicrobial agents such as silver compounds may be a useful alternative.This is a small case series and therefore results must be interpreted with caution. However, preliminary data is encouraging in that complex patients have had favourable results and Acticoat*7 was well tolerated in all patients. Work is ongoing on this series and further results are awaited with interest.

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IMPROVING THE ASSESSMENT AND MANAGEMENT OF CHRONIC LEG ULCER

Abstract

Introduction

Chronic leg ulcers are a significant health problem in the UK with the incidence rising with age. (Callum et al 1985). As well as having a considerable detrimental effect on quality of life and a high morbidity, they are associated with high financial cost. There is evidence that a structured assessment and management plan of leg ulcers can increase healing rates and reduce recurrence rates (SIGN guideline Number 26).

The majority of ulcers are managed in the community but a large number of patients are admitted to our acute teaching hospital. The admission can be purely for management of their leg ulcer or they are admitted with an acute illness. The patients who are admitted purely for the treatment of their leg ulcers have ulcers that can no longer be managed in the community, they are large and slow to heal. In 1997 I became Charge Nurse of a Medical Day Hospital and found that a large majority of attendees had leg ulceration, I thought that my Departments practice of assessing and treating ulcers was poor. I wanted to know the Hospitals practice regarding leg ulcer care therefore I carried out the audit.

This was a retrospective case note audit using discharge coding to identify patients with chronic leg ulcer. Documentation of aspects of ulcer assessment were noted including: onset of ulcer, size and site of ulcer, presence of allergies, hand held Doppler examination, identification of ulcer type and treatment plan. The audit was performed in 1997 and again in 2002.

Results

Initial audit 1997 (n=17):
Onset of ulcer documented in 11%
size 33%
site 67%
allergies in 56%
Doppler examination carried out in 6%
ulcer type identified in 56%
treatment plan documented in 50%

Follow up audit 2002 (n=23):
Onset of ulcer documented in 59%
size in 100%
site in !00%
allergies 100%
Doppler examination carried out in 88%
ulcer type identified in 94%
treatment plan documented in 94%

Discussion

The results of the 1997 audit confirmed that patients with leg ulcers were not having their leg ulcers assessed and managed properly, there were patients who had venous ulceration but no patients had compression bandaging. When a patient was admitted from the community with compression bandaging in situation there were no nursing staff who knew how to reapply the bandages, therefore they were removed and dressings only applied.

The results of the audit were used to develop and implement a local guideline and training programme based on the SIGN Guideline on leg ulceration.

Conclusion

This audit cycle has demonstrated a significant improvement in the assessment and management of leg ulcer in this group of elderly in-patients. This has been achieved through a comprehensive theoretical and practical training programme led by myself. This training specifies the need for a holistic approach with particular attention given to careful history taking, examination of the ulcer and the leg, and investigation including hand held Doppler to ensure accurate diagnosis. Now patients with leg ulcers admitted to the Hospital receive a leg ulcer assessment and receive the appropriate treatment. This is a continuous programme as staff leave and new staff arrive, Staff must attend a theoretical study day on leg ulceration, then they attend a three hour practical session on how to apply compression bandages and a two hour practical session on how to assess ankle brachial pressures. The Nurses then perform an O.S.C.E. on both procedures and are deemed competent, they also need to keep their skills updated by attending a an annual update. We strive to have two nurses per ward who can apply compression bandaging and one nurse per ward who can complete the leg ulcer assessment form including Doppler's. It has taken four years to complete the audit cycle, due to staff movement, devising and setting up the study days and supervising staff. It has been very successful and our patients now receive research based care by competent staff.

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THE EFFECTS OF A WARMING DRESSING ON POSTOPERATIVE PAIN AND WOUND HEALING AFTER HERNIA SURGERY

Abstract

Background

The problem of postoperative pain relief after hernia surgery is well established and is compounded because most patients having hernia repair are discharged on the same day as surgery, which prevents the titration of analgesia on subsequent days. It is very difficult to identify those patients who are going to experience higher than acceptable levels of pain after the first day of surgery when the effects of anaesthesia have disappeared. Short of providing all patients with opiate analgesia at home this problem has proved difficult to solve. Wound infection remains one of the most common causes of morbidity in the surgical patient, despite advances in surgical practices and the widespread use of prophylactic antibiotics. In our previous study we found an infection rate of over 12% in the patients receiving the standard care after hernia surgery within our hospital. The importance of infection rates in 'clean' surgery cannot be underestimated as they are now being used to determine surgical performance.

Very little research has been carried out looking at alternatives to oral analgesia in the postoperative hernia patient. One alternative may be to provide postoperative heat directly to the surgical incision, this may help reduce pain and also help wounds to heal. Previous studies have shown that the application of heat has proved beneficial in reducing pain and aiding wound healing.

In a pilot study completed last year we examined the effect of a radiant heat card applied to the surgical wound dressing and warmed intermittently for up to 7 days. We found that the patients in the warmed group reported significantly less pain after 2 hours of surgery and less pain over the first 7 days. There was 1 wound infection in the non warmed (7.1%) group but non in the warmed patients (0%). These promising results led us to develop a randomised controlled trial to examine more closely the overall effects of surgical wound warming on postoperative pain and wound healing.

Methods

A 140 patients having inguinal hernia repair are being randomised into two groups; Group A receives standard treatment (no warming); Group B receives 2 hours of postoperative warming to the wound immediately after surgery and then the patients warm their wounds twice a day for the first three postoperative days at home. An exothermic warming pad that adheres to the wound dressing provides the warmth. Pain scores are recorded for the first 4 hours after surgery and then over the next two weeks by the patient. Wounds are observed independently and healing is assessed at weeks 2 and 6.

Results

An interim analysis was performed on the first 50 patients recruited to the study, 1 patient had their operation cancelled after randomisation. The average age of the patients was 52 (18-79); there were 47 males and 2 females. 27 patients received warming and 22 standard treatment. Patient compliance with warming regimes was good (95%). Patients reported reduced pain after the application of the warming pads. Pain scores were lower in the warmed group compared with standard on each of the first seven post-operative days. The warmed patients required less post-operative analgesia and they were able to leave their own homes, on average, a day earlier than the standard patients (4.5 days vs. 5.7 days).
29 patients had completed the 6 week wound review at the time of analysis. Wound infection rates in the standard group was 7.1% (1/14) and 0% in the warmed group (0/15).
It is estimated that recruitment will be completed in October.

Discussion/Conclusion

This interim analysis supports the results found in the pilot study and suggest that postoperative warming of surgical wounds has potential benefits to both wound healing and postoperative pain relief.

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EXPLORING THE ANALGESIC EFFECT OF TWO COMPLEMENTARY THERAPIES DURING VASCULAR DRESSING CHANGE

Abstract

Introduction

Vascular wounds are often associated with considerable pain (Clark, Watson, & Reynolds, 1995; Walshe, 1995). This 'background' pain is often exacerbated by dressing changes (Collier & Hollinworth, 2000; Noonan & Burge, 1998). Complimentary analgesia, both essential oil odours and music, has been increasingly used in pain management, with positive results. Essential oil odours had beneficial effects in various populations including in neonates during blood sampling (Kawakami et al., 1997), women during childbirth (Burns, Blamey, Ersser, Barnetson, & Lloyd, 2000) and migraine sufferers (Hirsch & Kang, 1998). Music had beneficial effects during routine procedures for burn patients (Prensner, Yowler, Smith, Steele, & Fratianne, 2001), in post-operative pain (Good et al., 2001) and childbirth (Browning, 2000). In studies using cold pressor pain, lemon essential oil odour resulted in lower ratings of pain intensity than lavender or no odour (Brown, McVey, & Brodie, 2002) while preferred music significantly increased tolerance time compared to relaxation music or white noise (Mitchell, MacDonald, & Brodie, 2001). It was proposed, therefore, that lemon essential oil odour and preferred music might similarly reduce the pain associated with vascular wound dressings.

Method

In-patients with vascular wounds attending the Queen Margaret Hospital, Dunfermline were invited to take part in the study. After obtaining full ethical consent, in a within-subjects design eight completed the odour conditions comparing lemon and lavender essential oils with a no odour control condition and seven completed the music conditions comparing preferred and relaxation music with a no music control condition. The order of presentation was randomised. Pain intensity was assessed on a visual analogue scale and anxiety using the State Trait Anxiety Inventory (Spielberger, 1983).

Results

No differences between the patients pre-treatment were found for the variables of pain intensity or anxiety. No significant differences were found between the odour conditions or between the music conditions or compared to the control condition during dressing changes. However, post-dressing change there was a significant reduction in the level of pain intensity for the lavender condition ($p < 05$) but not for the lemon or control conditions. Also, there was an approaching significance reduction for preferred music ($p < .07$) but not for the relaxation or control conditions. No effect was found on anxiety for any condition. No significant difference was found between the two odour conditions in respect of the patients' preference but preferred music was liked significantly more than the relaxation music ($p < .05$).

Discussion

The results demonstrated that both lavender essential oil odour and preferred music are beneficial in reducing the pain experienced after vascular wound dressing change. However, this benefit was found to be for post dressing change pain intensity not for the pain intensity during a dressing change. This confirms the use of lavender in a clinical setting to alleviate pain (Buckle, 1999) but is contrary to the results of the experimental pain study (Brown et al., 2002). The finding for the music condition supports the studies by Menegazzi et al (Menegazzi, Paris, Kersteen, Flynn, & Trautman, 1991) and Perlini & Viita (Perlini & Viita, 1996) in a clinical setting and the experimental study (Mitchell et al., 2001).

The finding that there was no significant reduction in anxiety was contrary to previous studies by Miller et al (Miller, Hickman, & Lemasters, 1992) using relaxation music and Kikuchi et al (1991) using lavender essential oil odour. This may have been due to small subject numbers.

The greater pain reduction induced by lavender was not due to patients' preference for the lavender aroma over lemon. However, the greater pain reduction induced by preferred music may not be due to the distraction of music alone but may have been due to a positive emotional response to the preferred music. As expected the preferred music was liked significantly more than the relaxation music.

Conclusion

This pilot study has demonstrated that lavender essential oil odour and preferred music may well be beneficial to patients experiencing pain associated with routine vascular dressing changes. Further research is required with larger patient numbers.

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THE IMPACT OF A NEW CAVILON SKIN CARE PROTOCOL FOR PATIENTS CARED FOR IN NURSING HOMES IN THE UK

Introduction
Patients cared for in Nursing Homes are vulnerable to skin problems, particularly pressure ulcers and incontinence dermatitis. In old age the dermis of skin gradually becomes thinner, looses elasticity and becomes drier (Hunter *et al,* 1995) rendering the skin susceptible to damage. Incontinence dermatitis in old age increases the risk of damage when excess or caustic moisture from urine, stool or frequent washing reduce skin tolerance (Fiers, 1996). Nursing assessment tools and clinical guidelines designed to identify patients at particular risk of skin damage highlight both urinary and faecal incontinence as contributory factors (AHCPR, 1996). Pressure ulcer risk is also increased when the skin is left too wet over a prolonged period, as it becomes macerated or excoriated, increasing the risk of damage to the skin from friction (Hampton and Collins, 2001). This study is concerned with the skin of elderly, incontinent patients cared for in Nursing Homes. It investigates the implementation of a new skin care protocol, and the effect of this on skin condition, staff and product costs.

Method
A pre and post-intervention study design was employed in this study. Data were collected on skin conditions and skin care procedures, prior to and following the introduction of a new skin care protocol. A supportive educational programme was delivered to staff. Nurses and carers were observed as they undertook skin care following episodes of incontinence. The time taken, products and amounts used were recorded. The presence and severity of incontinence dermatitis was recorded, together with the presence and severity of pressure ulceration. The new sacral skin care protocol comprises using a skin cleanser, a barrier cream and a barrier film supplied by 3M Health Care*.

All patients with incontinence as also assessed in two randomly selected nursing homes (six participated). Following delivery of the educational interventions data collection was repeated.

Results
164 patients were included in the detailed assessments, 79 pre-intervention, 85 post-intervention. 49 were male (29.9%) and 115 female (70.1%). Only 3% were under 70 years of age, with 72% over 85. These patient profiles were very similar at both time points, indicating a frail, elderly population of patients. Pre-intervention 29.1% were incontinent of urine only, 64.6% were doubly incontinent and 6.3% were catheterised. Post-intervention 29.4% had urinary incontinence, 65.9% were doubly incontinent, and 4% were catheterised.

Following the educational programmes, both groups strictly adhered to the new skin care protocol, deviating from it on only one occasion. Skin condition was maintained or improved using the new skin care protocol. There was a significantly lower incidence of incontinence dermatitis after introducing the skin care protocol ($p=0.021$). The presence of a pressure ulcer did not significantly differ between time points although the presence of Grade 1 ulcers (EPUAP) was found to significantly decrease over time ($p=0.041$). There was a significant reduction in time taken to undertake skin care post-intervention ($p<0.001$) with a mean reduction of 32 minutes and 19 seconds per patient per day. This was associated with an average saving per patient per day of £8.83 (social cost) and £6.89 (NHS cost) when staff are on a qualified wage and £3.43 (social cost) and £1.49 (NHS cost) when staff are on an unqualified wage. The wage of staff is a major factor as much of the cost saving lies in the reduction of staff time.

Conclusion
When caring for patients with incontinence, it is important not only that skin condition is maintained or improved, but also that the costs of delivering care are not increased. In this study we demonstrated that the introduction of a new skin care protocol, supported by an educational programme, maintained or improved patients' skin condition, and significantly reduced the costs of delivering nursing care.

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* 3M™ Cavilon™ Durable Barrier Cream and 3M™ Cavilon™ No Sting Barrier Film and a proprietary skin cleanser were supplied by 3M Health Care

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A PROSPECTIVE, MULTI-CENTRE, RANDOMISED, COMPARATIVE STUDY TO COMPARE THE EFFECTS OF ACTICOAT 7 ANTIMICROBIAL BARRIER DRESSING TO AVANCE SILVER IMPREGNATED FOAM FILM DRESSING IN THE TREATMENT OF CHRONIC VENOUS ULCERS

Abstract
A number of innovative technologies have been developed for the treatment of chronic wounds in an attempt to accelerate healing rates. The majority of chronic wounds are contaminated with bacteria and reducing this bacterial load is a fundamental component in the successful healing of chronic wounds.

Although the use of topical antimicrobials are often effective in reducing bacterial colonisation, some chronic wounds remain difficult to heal and remain colonised or progress to infection. It is hypothesised that there are two possible populations of bacteria in wounds. The first population is in the surface component of the wound and this is responsive to topical anitmicrobial treatments. The second population is in a deeper compartment where topical antimicrobials remain ineffective due to poor penetration. In an effort to provide a more effective means to reduce wound colonisation and infection several dressings containing sliver have recently been developed.

The purpose of this study was to compare two silver containing dressings, Acticoat 7 and Avance.

Primary objective of this study was

- To assess the reduction in the bacterial count in the wound bed

Secondary objectives were

- Rate of wound healing
- Overall performance (exudate and odour control, application, removal and pain levels)
- Condition of the wound bed and surrounding skin
- Frequency of dressing changes

Forty patients in total with chronic venous leg ulceration were recruited from four centres within the Primary Care setting. Duration of treatment was 12 weeks, unless the ulcer healed before this time. Profore, multi-layer bandage system was used for compression therapy. Wound swabs were taken at week 0, 2, 4, 8 and 12. Full bacterial counts and bacterial identification were carried out in an independent central laboratory. Interim results of the first 16 patients demonstrated: in the Acticoat group 4 had healed within the 12 weeks and the remaining 4 patients were showing signs of improvement. In the Avance group 1 patient had healed, 3 were showing signs of improvement, 1 had deteriorated and 2 patients had been withdrawn due to adverse reactions.

Microbiology reports identified a variety of bacteria in both groups such as streptococcus, staphylococcus, pseudomonas and proteus.

There was a decrease in the median value of colony forming units in the Acticoat 7 group compared to the Avance group where the colony forming units showed a slight decrease then an increase.

This presentation will illustrate the analysis of the data obtained for the forty patients recruited into this study.

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A CASE HISTORY TO DESCRIBE THE JOURNEY OF A PATIENTS ADMITTED TO HOSPITAL WITH NECROTISING FASCIITIS

Abstract

Introduction

Necrotising fasciitis is a serious soft tissue infection generally cased by Group G Streptococci. The infection results in extensive soft tissue destruction of skin, subcutaneous tissue and muscle. Often surgical intervention in combination with antibiotic therapy is required. Mortality rate is high particularly if treatment is delayed. Infection is often the result of a skin abrasion or puncture wound that becomes infected with Streptococci bacteria**.**

History

This presentation will describe the journey of a female patient admitted to hospital with a necrotic area in the groin. The patient had a three-week history of nausea, anorexia, diarrhoea and weight loss. The patient attributed her problems to the fact she was taking drugs for the treatment of rheumatoid arthritis. She was referred to the surgical team two days later and was taken to theatre for debridement of necrotising fasciitis in the left groin. Day one post op she developed peritonitis from a perforated sigmoid diverticulitis. A Hartman's procedure was performed and the patient returned to the surgical high dependency unit.

Results

The patient experienced psychological problems relating to fear of her illness. Unfortunately the disease returned and she had to go back to theatre. She was very upset regarding the odour associated with the disease, this was due to the anaerobic infection in the fasciitis. There were also problems related to the management of exudates, the wound was also very painful at dressings changes. The use of vacuum assisted healing contributed to exudates control and the promotion of healthy granulation tissue. Entonox was used for pain relief at dressing change. The patient progressed to split skin graft and is doing very well.

Conclusion

Lessons learned:

- The importance of psychological support and constant reassurance for the patient.
- Keep the patient informed regarding the condition
- The importance of immediate treatment for suspected necrotising fasciitis
- The value of vacuum assisted therapy in exudates management

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MANAGING PATIENTS WITH SICKLE CELL LEG ULCERATION – A CASE STUDY APPROACH

Abstract

Introduction

Leg ulceration is a common problem affecting 1-%-2% of the population. Of those patients presenting with leg ulceration approximately 1% is associated with blood disorders such as sickle cell disorders. Cackovic et al (1998) noted a 25-75% incidence of leg ulcers in patients with sickle cell disorders. Many of these occur in young people aged 10-35 years and healing can take sixteen times longer than in those with leg ulcers from other cases (Anionwu 2002). This case study will discuss the assessment, management and follow on preventative care programme for a young gentleman with sickle cell leg ulceration. The SOAPIER format (Cox 1993) to history taking and Neumans Systems Model of Nursing are incorporated into the case study to provide a 'total person approach to care'.

Results

Chris a 39year old gentleman was referred for specialist advice by the haemoglobinopathy nurse specialist. Chris had bilateral painful leg ulceration which he was self -managing. He had recently recovered from a sickle cell crisis for which he had been an inpatient. He reported four previous episodes of small ulceration in 3 years, which he had healed with self-intervention. The current ulcer was having a significant effect on his quality of life. Management included addressing the following key areas:

- Anxiety and reduced quality of life
- Leg ulceration associated with sickle cell disease
- Wound infection
- Pain at dressing change

using evidence from the literature and from expert practice/opinion, and involving the patient in the decision making process. Chris's ulcers healed in 6 months. He is currently being monitored closely in our healed leg ulcer clinic.

Discussion

The new NHS places great emphasis on clinical governance and on evidence based practice. The reality for some areas of practice is that the evidence is not always available. There is strong evidence for the management of venous leg ulcers using compression therapy, however where leg ulceration is associated with sickle cell disorder; there is very little work to support our practice. We now live in a multi-cultural society and are likely to see increasing numbers of patients with this type of ulcer. We should be sharing our experiences and encouraging best practice

Conclusion

Case studies are a useful way of sharing best practice in areas where there is limited evidence available. As clinicians interested in wound care we should be working together to generate new evidence both qualitative and quantitative into areas where there is clearly a patient need, even if it is a smaller number of patients who would benefit.

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AUDIT OF LEG ULCER RECURRENCE

Abstract

Introduction

National studies have shown that venous leg ulcers recur within 6 months in 25-65% of patients (Moffatt 1995). Current studies are looking at possible reasons for this. Local studies suggest that recurrence figures are between 4-7% which is greatly encouraging.

This audit is an in-depth look into possible reasons for recurrence, measuring against practice standards taken from RCN guidelines. Focusing primarily on the use of compression hosiery. Considering also reasons for recurrence in compliant patients.

Data Set

- Patients who have had recurrent venous leg ulcers within the last 24 months of being treated for the same.
- Data was compiled retrospectively by the end of each calendar month by the district nurses,

Definitions

Compliant:

Patients who have been wearing compression hosiery since healed.

Non-Compliant

Patients who have not been wearing compression hosiery since healed.

Compliance

Non compliant 24%
Compliant 76%

Results

Recurrence within Time Frame

- 63.3% recur within the first 6 months
  (of these 84.21% are in the compliant patients)
- 23.3% recur within the first 12 months
  (of these 71.4% are compliant)
- 16.6% recur within the first 18 months
  (of these 33.3% are in the compliant patients)
- 3.3% recur within the first 24 months
  (all of these are compliant)
- All non compliant patients had at least one reason documented for not wearing the compression hosiery
- There were 28 possible instances that led to recurrence of leg ulcer in the 23 compliant patients
- These can be broadly classified into:
  25 medical instances/reasons
  3 stocking related instances/reasons
  Each of which were considered in more detail
- At an average 80% patients received the information
- At an average 87% patients complied with the information given to them

Risk factors in all patients were also considered, these included:-

- Venous assessment
- Deep vein thrombosis
- Deep vein incompetence
- Varicose veins
- Varicose vein surgery
- Previous ulceration – sizes and duration were considered

Recommendations

- Develop an assessment of risk tool to be used, once healed. Thus identifying clearly areas where action is required, eg referral for venous assessment, carer involvement for application of compression hosiery.
- Education under-pinning implementation of such a tool.
- Share data with hosiery providers, discussion regarding possible ways of overcoming problems experienced

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COMPRESSION FOR VENOUS LEG ULCERS VIA BANDAGES OR STOCKINGS: RESULTS OF A PILOT STUDY COMPARING THE PERFORMANCE OF A TWO-LAYERED COMPRESSION STOCKING SYSTEM WITH THAT OF SHORT STRETCH BANDAGE

Abstract

Introduction

The mainstay of the management of venous leg ulceration is the application of sustained graduated compression from toe to knee via bandages or hosiery. Properly applied, compression bandages can heal up to 70% of venous leg ulceration. However incorrect bandages are frequently used (Roe et al 1994) and bandaging technique is generally poor (Nelson et al 1995). In addition the application of the bandages frequently causes discomfort to patients leading to poor compliance.

The SurePress Comfort® Graduated Compression System provides easily applied, reproducible and graduated compression, via a two-layered stocking system composed of a silky understocking, that facilitates the easy application of the overstocking.

We report on a recently completed study which had a primary objective of evaluating the proportion of ulcers that healed following the management of venous leg ulceration with SurePress Comfort, or a short stretch bandage.

Method

A multi-centre randomised controlled clinical trial of 12 weeks duration assessing the following parameters:

- Primary parameter:
- Proportion of ulcers healed
-
- Secondary parameters:
- Time to complete healing
- Reduction in ulcer size
- Ease of application and removal
- Comfort and compliance

Results

A total of 56 subjects were included in the study from 3 centres in Italy.

Twelve out of 27 (44.4%) ulcers treated with SurePress Comfort healed compared to 5/29 (17.2%) ulcers treated with the short stretch bandage within the 12 week study duration (p=0.027).

Ulcers treated with SurePress Comfort healed significantly faster than those treated with short stretch bandages: on average 29 days faster (p=0.0265).

Ulcers in both treatment groups reduced in size to a similar extent over the treatment period (p-ns).

In terms of ease of application, ease of removal and comfort in use, although not statistically significant, a consistent advantage was associated with SurePress Comfort over short stretch bandages.

In addition, the use of SurePress Comfort was associated with a greater pain relief than the short stretch bandage (p=0.017).

Discussion

Although used less often in the UK, short stretch bandages are used commonly in Europe to treat venous leg ulceration. A systematic review found no clear differences in the effectiveness of different types of compression systems, and concluded that rather than advocate any one particular system, the use of any correctly applied compression system should be promoted (Fletcher 1997). A compression stocking system could enable patients to apply their own compression, and thus save valuable nursing time, whilst at the same time providing patients with a better quality of life as stockings are less bulky than bandages and are therefore less likely to restrict mobility. This study found that in terms of healing SurePress Comfort was more effective than short stretch bandages, and also offered some advantages in terms of ease of application, removal and patient comfort. In the face of escalating demands on nursing resource, this latter aspect should be investigated further, as stockings could provide an effective, viable alternative to bandages in the management of venous leg ulceration.

Conclusion

In this study the SurePress Comfort graduated compression system was more effective than short stretch bandage in treating venous leg ulcers, and could have potential to offer advantages in terms of application, and patient quality of life.

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COLOUR ANALYSIS OF SKIN WOUND IMAGES USING DIGITAL IMAGE PROCESSING

Abstract

Introduction

Analysis of the distribution of colours within a wound image may be of clinical value by quantifying the progress of healing. However it is probable that colour assessment may be both more repeatable and reliable when performed using digital image processing techniques rather than the human eye! We have previously developed a wound imaging toolbox for the colour assessment of wounds using image processing techniques [1]. The aim of this study is to continue to report on the colour analysis within 50 images of venous leg ulcers with particular emphasis on the assessment of amount of slough (necrotic tissue) within the wound.

Methods

Fifty venous leg ulcers were photographed using a digital video camera (Panasonic NVDX100 B, Matsushita Electric Industrial Co. Ltd., Japan) within an outpatient wound clinic. This 3CCD array video camera has a separate CCD chip for each colour component (Red, Green and Blue). A 10W video light was fitted to the camera to improve lighting conditions. A graduated colour scale (Fuji Colour Scale) was included in each image to provide a colour reference. The Hue, Saturation, Intensity (HSI) colour model was used to analyse the images and from each image hue, saturation and intensity values in and around the wound were recorded. The wound boundary was delineated using a mathematical spline based model [1]. The area within the wound boundary was used to calculate the amount of slough in relation to overall size of the region as a percentage. A subjective grading system (Grade 1, clean to Grade 5, heavy slough) was used by an experienced clinician (K.G.H.) to assess the amount of slough in wounds viewed as digital images. This was then compared against the results of digital colour image analysis.

Results

For colour variability tests, there was a maximum change of 8 degrees in hue, 12% change in saturation and 50% change in intensity in the red colour reference patches. There was a 36% complete agreement in the amount of slough as determined by the image analysis and the clinician's grading. In 54% of images there was a difference of only one grade. The remaining 10% of images resulted in difference of two grades.

Discussion

The red hue in the colour reference patches changed only 8 degrees which suggests that the hue is the most stable component of the HSI colour model. The clear changes between the hue values of the inner, the outer wound and the healthy tissue were observed which might be of value in describing the colour changes. The shift in red hue values can be corrected by the use of a colour reference to obtain more reliable results.

Colour image processing may provide a tool for assessing the appearance of the wound images more objectively. The wound imaging toolbox described here was used to quantify the amount of slough in leg ulcer images and its results are in 90% agreement with the clinician's assessment. The assessment of wound appearance from digital images alone, however, may not be sufficient for experienced clinicians. There are other factors such as pain, size, surrounding tissue and the patient's history all of which should be taken into account.

Conclusion

This study demonstrated that recording wound images digitally is a feasible method of determining wound colours under clinical conditions. Hue appears to be the most stable component of the HSI colour model. The developed wound imaging toolbox may be of value in objectively assessing the colour appearance of the wound images.

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BIOPSY OF CHRONIC NON-HEALING LEG ULCERS: ARE SQUAMOUS CELL CARCINOMA AND BASAL CELL CARCINOMA MORE COMMON THAN BELIEVED?

Abstract

Introduction

Assessment of non-healing chronic wounds includes relevant medical history, examination and investigation. Wound edge biopsy for histology is indicated when the wound exhibits features suspicious of malignancy. Is there a case for biopsy of non-healing ulcers that do not exhibit features of malignancy?

Method

Case records for all clinic patients who had biopsy of a leg ulcer over a 3 year period (May 2000 – May 2003) were examined. Note was made of the indication for biopsy and histological diagnosis. The findings are presented here.

Results

The Wound Healing Research Unit, University of Wales College of Medicine is a tertiary referral centre serving a population of 300,000 and sees approximately 3000 patients per year.

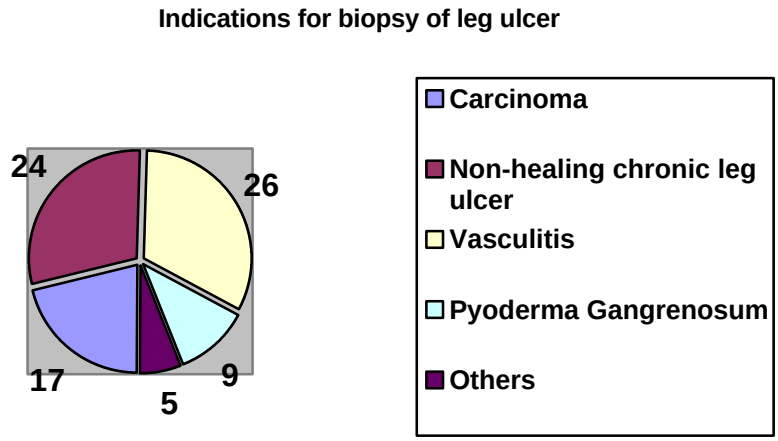
In total 118 biopsies were performed, of these 81 were leg ulcers (males 34, females 47). The descriptive statistics for subject age is shown in Figure-1 below.

Figure-1 Patients who underwent leg ulcer biopsy

mean age (n=81)	67.1
Standard Deviation	17.7
Maximum - Minimum age	97 - 29

The indications for biopsy were as follows (Figure-2). The terms 'Carcinoma' and 'Vasculitis' used in respect of indication, refer to a recorded clinical suspicion of a diagnosis based on the history and appearance of the wound. The term non-healing leg ulcer refers to a chronic venous ulcer with no appearance suggestive of malignancy.

Figure-2



The 5 indications in the 'Others' category included; non-healing Sacral wounds (3), erythematous skin eruption (1) and Lichen Sclerosis (1).

MR DAVID MILLER (Contd')

Each biopsy was examined by one of a panel of six Consultant Pathologists and reported in a standardised format. The histological diagnosis according to indication for biopsy is recorded below (Figure-3)

Figure-3 Frequency of each histological diagnosis according to indication for biopsy

		Confirmed histological diagnosis							
Indication for biopsy	**Number of times**	**SCC**	**BCC**	**Bow-en's dis.**	**Venous stasis**	**Vasc-ulitis**	**Isch-aemia**	**Other diagnosis**	**Non-specific**
Carcinoma	17	3 18%	1 6%	0	2 12%	0	0	0	11 65%
Vasculitis	26	0	0	0	3 12%	1 4%	1 4%	0	21 81%
Chronic non-healing ulcer	24	**3 13%**	**3 13%**	**3 13%**	5 21%	0	1 4%	0	9 37.5%
Pyoderma Gangrenosum	9	0	0	0	1 11%	0	1 11%	2 (22%) Pyoderma Gangrenosum	5 56%
Sacral pressure ulcer	3	0	0	0	0	0	1 33%	0	2 67%
Eruption on legs	1	0	0	0	0	0	0	1 Eczema	0
Lichen Sclerosis	1	0	0	0	0	0	0	1 Lichen Sclerosis	0
Total	81	6 7%	4 5%	3 4%	11 14%	1 1%	4 5%	3 4%	49 61%

Key: SCC=Squamous Cell Carcinoma, BCC=Basal Cell Carcinoma

Discussion

The most significant finding was of 9 cases (39%) of malignancy in the 24 biopsies for chronic non-healing venous leg ulcers (in the absence of clinical features suggestive of malignancy). These included 3 cases of Squamous Cell Carcinoma (SCC), 3 cases of Basal Cell Carcinoma (BCC) and 3 cases of Bowen's disease (Carcinoma-in-situ).

Skin tumours arising *de novo* are known to vary with climate and are more common in females and on the limbs and face [1]. Less is known about tumours associated with chronic leg ulcers however there is a general consensus that it is an uncommon event. Most epidemiological studies are based on patients attending tertiary referral wound or dermatology clinics, which are not representative of the general population. The majority of leg ulcers never present to a tertiary referral centre so actual incidence and prevalence of associated malignancy is unknown.

An SCC arising in a chronic leg ulcer is known as a 'Marjolin's Ulcer'. A Swedish study calculated relative risk of an SCC arising in a venous leg ulcer as 5.8 (95% Confidence Interval 3.08-9.29) [2]. Similarly Voisard et al. (2001) reported that malignancy arising in a venous leg ulcer occurred with a frequency of less than 1 in 300 [3]. In Western Australia the frequency of malignancy in leg ulcers is reported as 2.2 per 100 leg ulcers with BCC three times more common than SCC [4].

Basal Cell Carcinoma can arise either as a primary skin tumour which mimics the appearance of an ulcer or as a secondary malignant transformation in an existing venous ulcer. It is not possible to ascertain to which category the BCC's in our series belong.

Conclusion

We would advocate a low threshold for biopsy in any chronic non-healing leg ulcer even in the absence of features suspicious of malignancy.

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HEALTH ECONOMIC ANALYSIS OF A SILVER CONTAINING HYDROACTIVATED FOAM DRESSING IN DELAYED HEALING LEG ULCERS

Abstract

Introduction

In the UK the prevalence of chronic leg ulcers is between 0.15 – 0.75% in people above 65 years and with an incidence of 0.76% approximately 63,000 patients are diagnosed in this age group every year in the UK. The cost associated with treatment of chronic leg ulcers has been estimated to be £ 390 million per year in the UK. However, costs are not only monetary; human suffering, pain, disfigurement, loss of productive time, and body image changes are all potential consequences of a chronic leg ulcer.

In a time with increasing economic pressure upon healthcare providers the demand for evidence of cost-effectiveness of available treatment options is obvious.

The cost-effectiveness of four different wound care dressings used in the treatment of delayed healing venous leg ulcers was analysed in context of UK settings. I.e. three antiseptic dressings; a silver containing foam (Contreet Foam, Coloplast A/S), an iodine containing paste (Iodoflex®, Smith & Nephew), a silver/charcoal containing cloth (Actisorb silver 220®, Johnson & Johnson) and one foam dressing without antiseptic properties (Allevyn®, Smith & Nephew).

Methods

A well-documented health economic model (Markov) was used and adjusted to reflect wound care practice. Clinical effectiveness data were collected from published clinical trials on all wound dressings represented in the analyses.

All analyses had the perspective of the healthcare sector. The timeframes for the analysis was 4 weeks and 6 months. Endpoints used in the analysis were reduction in wound area and number of healed wounds.

An independent UK clinical expert panel validated methods, cost, resources, and clinical data as well as treatment practice used in the analyses. Sensitivity analyses were undertaken to evaluate robustness of all results.

Results

The cost of weekly treatment with Contreet Foam was £120 compared to £146-187 for the other dressing alternatives. The cost per percentage reduction (4 weeks) and the cost per healed wound (6 months) were for Contreet Foam £9 and £1228, respectively. The costs for the other dressing alternatives ranged from £12-17 and £1970-2339 respectively.

	Unit cost of primary dressing per dressing change	Cost per week of treatment	Cost per % reduction in wound area	Cost per healed wound
Contreet Foam	£6.95	£120	£9	£1228
Allevyn	£2.10	£161	£16	£2021
Actisorb Silver	£2.32	£187	£12	£1970
Iodoflex	£7.80	£146	£17	£2339

Sensitivity analyses showed that the results were robust. Nursing time costs combined with the dressing frequency changes had a major effect on the results.

Discussion and Conclusion

Treatment of delayed healing chronic venous leg ulcers in the UK is associated with relatively large costs. Contreet Foam, which has earlier been demonstrated, to be safe in use as well as clinical effective has now in addition proved to be cost-effective in treatment of delayed healing venous leg ulcers. The use of Contreet Foam could potentially result in actual savings in the UK health care sector of £4.2 millions annually.

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HOW MUCH IS TOO MUCH SILVER?

Abstract

Introduction

Ionic silver has long been recognized for its broad spectrum antimicrobial properties. Over the last century this property has been exploited to produce solutions and ointments for opthalmic drops and topical applications for burns and abrasions. In recent years there has been a flurry of wound contact products reaching the market that have incorporated silver directly into the dressing matrix. Antimicrobial effectiveness of the various products has been hotly debated among the manufactures but far less has been reported regarding the effect of silver on tissue cells that come in contact with these products. This study was conducted to evaluate tissue cell responses to ionic silver.

Results

The silver reservoir systems used in wound dressings either are a form of metallic silver or a silver salt. Metallic silver reservoirs are known to undergo bolus release profiles when exposed to moisture whereas silver salt systems typically rely on equilibrium dynamics that result in the release of lower concentrations of ionic silver. In vitro testing showed that the products utilizing these reservoir systems had equivalent action on test organisms using zone inhibition testing. By contrast, products using metallic silver reservoirs produced more rapid bactericidal action than products utilizing silver salt reservoirs. Silver metal products typically reduced the numbers of organisms below the threshold of detection within 30 minutes to 3 hours whereas products that used silver salt equilibrium release mechanisms required between 90 minutes to 4 hours. The bolus release of silver ion may be beneficial to rapidly reducing the bioburden in wounds but it may be deleterious to tissue cells. A titration of ionic silver against mammalian tissue culture cells showed that the IC_{50} was approximately 50 ppm for a 24 hour exposure and 25 ppm for 48 exposure during in vitro culture. Since metallic silver dressings are reported to establish between 70-100 ppm silver during release, examples of those dressings along with ones using silver salt release mechanisms were tested, using the Alomar Blue dye reduction test of viability of fibroblasts exposed to various dressings. The results showed that viability was reduced greater than 90% when cells were exposed to metallic dressings. By contrast, cells exposed to dressings utilizing silver salt reservoirs caused less than 10% decrease in viability. These findings were further illustrated by the application of silver dressings directly on monolayers of fibroblasts and keratinocytes followed by visulization using a fluorescent dye that contrasts living and dead cells.

Discussion

Moisture mobilization of silver deposition coatings results in the release of large amounts of silver. It has been reported that levels up 100 ppm can be established from these reservoir systems. By contrast silver salt systems utilize weakly soluble salts of which the solubility is controlled by equilibrium dynamics. For example silver chloride is predominately a solid in water however a portion always exists in the ionic form. The concentration of the ionic species in water will remain at about 1.43 ppm until all of the solid has dissolved. Yet the information above shows that this is sufficient to inhibit or kill a broad range of microorganisms. Tissue cells are not refractory to silver. Ionic silver has been shown to be cytotoxic for fibroblasts and keratinocytes in this study. Moreover products that release too much silver have a demonstrable effect on the growth and adhesion of cells in vitro.

Conclusion

Silver is an effective broad spectrum antimicrobial that has utility for that purpose in advanced wound dressings. Care must be taken when selecting dressings to avoid the use of those that may be cytotoxic to wound tissue cells.

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HETEROGENOUS PRESENTATION OF SQUAMOUS CELL CARCINOMAS IN LIMBS

Abstract

Introduction

Squamous cell carcinomas (SCC), the second most common cutaneous malignancy, may arise *de novo,* from a pre-malignant lesion, or from long-standing venous ulcers and burn scars. It is amenable to conservative surgery if detected early; however, due to the tumour's propensity for local destruction and deeper invasion, delay would necessitate more radical surgery and even result in amputation of the affected limb. The clinical presentation of SCC ranges from innocuous appearing lesions to overtly fungating ulcers. We report three cases of SCC with very different clinical presentations, and highlight the importance of biopsy and the need for early intervention.

Case 1:

A 73-year old lady presented to our unit with a 12-month history of non-healing ulcer in her leg. It started insidiously as a small (< 2cm diameter) ulcer and she self-treated it with germoline for 9 months. Since the ulcer failed to resolve, she was reviewed by her GP and was treated conservatively by the district nurses for a further 8 weeks. The ulcer was getting bigger and was hence referred to our unit for specialist input.

The ulcer covered the anterior and lateral aspects of her left lower leg (18 x 16 cms in maximum diameter), extending from 6 cms above the ankle to 13 cms below the knee joint. It had irregular borders, everted edges, necrotic areas in the ulcer bed, and was malodorous. In addition, there was a satellite lesion in the superior aspect of the ulcer. Biopsies from the four corners of the ulcer were taken and this revealed the ulcer to be a moderately differentiated SCC. A bone scan showed the tumour to erode the tibia. An enlarged groin lymph node was also detected, biopsy of which revealed a metastatic SCC. Since no limb saving procedure was possible, she underwent above-knee amputation. She is awaiting radical groin lymph node dissection at present.

Case -2:

A 68-year old gentleman with a history of varicose veins was treated in our unit with a 12-month history of venous leg ulceration. It showed progress initially with compression treatment, but later became a static non-healing wound. The ulcer was shallow, with well-circumscribed borders, regular edges, islands of granulation tissue, and also some re-epithelialization. However, since the ulcer failed to resolve with conservative treatment, a biopsy was done to rule out a Marjolin's transformation. The histology revealed this innocuous appearing ulcer to be a poorly differentiated invasive SCC. No groin lymph nodes were palpable. He had excision of the lesion with 1 cm margins and split-thickness skin grafting. The margins were clear of tumour on histological examination and he remains symptom-free at present.

Case -3:

A 73-year old lady was referred to our unit with an 18-month history of non-healing lesion over her left index finger. Since the lesion was recurrently over-granulating, it was being treated with silver nitrate in the primary care. The lesion (8 x 7mm in maximum diameter) was on the dorsal aspect over the distal inter-phalangeal joint (DIPJ) of the left index finger. It had a smooth surface, regular border, and was not ulcerated. It was fixed to the deep tissue and she had reduced range of movement in her DIPJ. There was no regional lymphadenopathy. A biopsy for histopathology was done and it revealed the lesion to be a moderately differentiated SCC with deeper extension. She is being referred to the hand surgeons for surgical excision and reconstruction.

Discussion

SCC can have very varied presentations: (i) no signs (ii) simple lesions (iii) overt fungating ulcers. In the early stages, SCC is amenable to simple excision and reconstruction, as observed in patient-2. However, any delay would necessitate a more radical approach and even could result in limb loss as observed in patient-1. Furthermore, unlike basal cell carcinomas, SCC have a predilection for lymph node metastasis, particularly those arising from edges of ulcers and sinuses (20%). If the tumour is operable, the 5-year survival of patients with lymph node metastasis is 39% and this reduces to 12.2 months if the tumour is inoperable.

Conclusion

Early, accurate diagnosis is imperative in the management of SCC. It needs to be appreciated that all SCC do not always exhibit the classical signs of malignancy. Therefore health professionals, both in primary care and in hospitals, should have a high index of suspicion in any non-healing ulcer or lesions and adopt a low threshold to biopsy them. Likewise, chronic ulcers in unusual sites which are refractory to conventional treatment should be considered malignant until proven otherwise.

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PAINFUL LEG ULCERS: PREVALENCE, CHARACTERISTICS AND THE IMPACT OF TREATMENT

Abstract

Introduction/Aim

Pain is a frequently reported feature of chronic leg ulceration [1-2]. However, the causes of pain in patients with leg ulcers are often poorly defined. The pathologies associated with leg ulceration (e.g. rheumatoid arthritis, vascular disease and diabetes) cause pain with or without an ulcer present. The presence of an ulcer may cause further pain through the inflammatory process associated with injury leading to nociceptive pain. However, the pain may also have a neuropathic element through the impact of damage to the peripheral nerves[3]. This study aimed to determine the proportion of people with pain as a result of chronic leg ulceration and explore the nature of the problem of painful leg ulcers. Two studies were designed to address this.

Method

Study 1 was a prevalence study. This involved prospective data collection from community health professionals; hospital vascular and dermatology departments and nursing homes. Details about leg ulceration and pain were captured. Staff were also asked about pain assessment. The validity of the data was tested using telephone follow up and home visits. Study 2 was a longitudinal study. A cohort of 92 patients was followed up every 2 weeks for 6 months or until healing was achieved. Size, type, duration and position of the ulcer were documented. Patients completed a diary of pain scores. Neuropathic pain was identified using the Leeds Assessment of Neuropathic Signs and Symptoms. For study 2 all patients referred from the DNs who fitted the inclusion criteria detailed below were invited to take part.

Inclusion criteria: Patients were eligible for inclusion if they had

- a venous, mixed or arterial leg ulcer treated by a District Nurse.
- a leg ulcer larger than 1 cm in any dimension
- an ulcer on or above the malleolus and below the knee with a minimum duration of 1 week.

Exclusion criteria: Patients were excluded if they had:

- terminal illness (defined as currently being cared for by the palliative care team)
- cognitive impairment, dementia or mental health problem
- unsuitable home circumstances to due to poor social or health status

Results Study 1

Response rates for groups surveyed for the prevalence study were District Nurses (n= 86) 98 %; Nursing Homes (n=47) 96 % GP Practices (n=50) 34% Hospital Clinics (n=11) 91%. A total of 510 patients with leg ulceration were identified. The mean age was 78 (SD 11 years) with a range of 31-103 years. The ratio of female: male was 2.56:1. The adult population in Leeds aged 30-over 90 years is 423,895 according to the population Census of 2001 (National Statistics 2003) and this figure was used as the denominator. This gives an estimated prevalence of 1.2 per 1000 of the population (or approximately 0.12% of the Leeds population). Over 70% had pain daily from their leg ulcers and in 40% of cases neuropathic mechanisms were dominant. Community nurses were involved in the care of 90% of the patients. Pain scales were used by only 9% of the nurses and the leg ulcers treatments were the same whether people had mild pain or severe pain.

Results Study 2

The total number of leg ulcer episodes observed was 96 (from 92 patients). The age range was 48-100 years old with 30 men and 66 women. In 54.7% of cases the pain was nociceptive and in 43 cases (45.3%) neuropathic elements dominated the pain experience. Median LANSS scores were 6 and 14 respectively (score < 12 neuropathic mechanisms are unlikely). There was a statistically significant correlation between LANSS scores and pain intensity. Mean VAS nociceptive group was 31.5 and neuropathic group mean VAS was 51.6. ($p < 0.001$) Neuropathic symptoms were statistically significantly associated the increased pain. Pain severity could not be predicted by position, type,
duration or size of ulcer.

Conclusion

Pain is a common feature of leg ulceration. Pain severity was not associated with size, type, position of duration of ulceration but was associated with neuropathic pain mechanisms. The frequency of pain assessment was low and pain intensity did not impact significantly on nursing treatment.

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CHANGES IN THE MICROCIRCULATION ON THE APPLICATION OF COMPRESSION BANDAGES IN THE LOWER LIMBS

Abstract

Introduction

Compression bandages are the main prescribed treatment for venous leg ulcers. However there remains some controversy regarding whether the application of a compression bandage decreases or increases the microcirculatory perfusion in the lower limb. In part, this confusion may arise from the uncontrolled modification of the compression applied by the bandage when local perfusion is assessed by either mounting probes beneath the bandage or through windows created in the bandage. In a previous study we have demonstrated that measurements in the arm can be obtained through an intact bandage using laser Doppler flowmetry. The aim of this study was to investigate the local microcirculatory perfusion changes beneath an intact compression bandage on the lower limb.

Method

The local skin microcirculatory perfusion (expressed as perfusion units, pu) was assessed in seven volunteers while either supine or standing with equal weight on both legs. The blood flow was measured using a Periflux® 4001 Master Laser Doppler fitted with PF 418 master probes, and attached to a computer for data collection (486 Viglan). The microcirculatory perfusion was assessed over the medial aspect of the greater circumference of gastrocnemius muscle skin and at the same location through a single layer of an applied compression bandage (Size C, Tubigrip™). A light transmissive gel was applied between the probe and the skin for the skin measurements and to the outside of the compression bandage where it was allowed to permeate through to the skin to allow for signal transmission for measurements. The Laser Doppler Probe was attached to the leg using a probe holder fixed to the skin or bandage by four small elasticated hooks. Four pieces of adhesive cotton backed tape (Elastoplast) were placed on the skin to which the hooks were anchored. When the compression bandage was applied the hooks were attached to the bandage. To assess the amount of applied force asserted by the compression bandage, over the medial aspect of the gastrocnemius muscle, sub-bandage force was measured using a temperature compensated strain gauge force transducer (Gaeltec), 13mm in diameter and 3mm thick located at the skin bandage interface.

Results

The mean (standard deviation) perfusion on the un-bandaged skin with transmissive gel applied while supine was 5.4(0.3) pu, and while standing 4.3(0.8) pu. When the compression bandage was applied and permeated with transmissive gel the perfusion both decreased while, supine 1.2(0.1) pu, and standing 1.5(0.9) pu. The median (range) sub-bandage pressure while supine was 13(9-15) mmHg and while standing was 18(12-28) mmHg.

Conclusion

There were clear changes in the microcirculatory perfusion on the application of a compression bandage. There were also microcirculatory differences observed with changing posture. The sub bandage pressures observed were typical for one layer of this type of compression bandage and changed with posture.