

A retrospective review linking diarrhoea to pressure ulcers

Andrew Kingsley

Abstract

Background: Patients with reduced mobility are at risk of pressure ulceration. Urinal or faecal incontinence increases the vulnerability of skin to damage and the European Pressure Ulcer Advisory Panel has identified that moisture lesions contribute to the development of pressure damage. In one UK district general hospital a sudden rise in the incidence of pressure ulcers coincided with an outbreak of infectious intestinal disease caused by *Clostridium difficile* and Norovirus.

Objectives: To determine if circumstantial evidence was present to link the rise in pressure ulcer incidence with the outbreaks of diarrhoea. **Methods:** All patients who experienced pressure ulceration and diarrhoea in the period January to March 2006 were identified and their case notes were reviewed. The dates of the onset of diarrhoea and pressure ulceration on the buttocks and sacrum were compared and any relevant written notes by nurses or doctors were examined. **Conclusions:** Twenty-three patients who had pressure ulcers also appeared as symptomatic cases on the diarrhoea outbreak lists. Fourteen cases were considered to demonstrate aetiological linkage to the presence of diarrhoea. Sufficient circumstantial evidence was demonstrated to persuade the healthcare trust to take action on the institution of skin care measures for all patients with incontinence. **Conflict of interest:** None

KEY WORDS

Pressure ulcers
Moisture lesions
Diarrhoea
Clostridium difficile
Norovirus
Incidence

Patients with reduced ambulatory capacity and decreased ability to move themselves regularly while sitting or lying, whether through functional ability, desire or simply because they do not recognise the need to move, are at greater risk of acquiring pressure ulcers. Reduced movement often coincides with periods of hospitalisation for debilitating illness, investigations or surgery, and depending on the individual case it may be temporary and associated with treatment or transient illness or be part of an increasing dependency requiring ongoing nursing care. Pressure ulcers may also occur at home before admission prompting the need to assess each patient

Andrew Kingsley is Clinical Manager Wounds UK and was Tissue Viability Nurse Specialist, North Devon District Hospital

within six hours of admission (National Institute for Clinical Excellence, 2005).

Prevalence of pressure ulcers in the UK is still high with one multi-centre study (Phillips and Busby, 2006) recording a prevalence of 11.3% from a pool of healthcare facilities who engaged in routine clinical audit with a single supplier-partner over a 19-month period (between January 2005 and July 2006). Studies of UK hospital incidence figures have been reported to range from 2.2% per annum to 29% (Kaltenthaler et al, 2001). Local North Devon quarterly incidence figures between October 2004 and December 2005 ranged from 1.7–1.9%. A sudden and unexpected rise to 2.4% in the quarter January to March 2006 occurred prompting further investigation which resulted in a retrospective case review.

Incontinence

The impact of faecal incontinence on skin and wounds has been documented previously (Beldon, 2007) and, along with urinary incontinence, is considered to increase vulnerability to skin breakdown (Stephen-Haynes and Gibson, 2004). Moisture lesions — 'skin lesions associated with incontinence and not caused by pressure or shear' (DeFloor et al, 2005)

(Figure 1) — is a term which is now becoming more commonly used in tissue viability circles. The European Pressure Ulcer Advisory Panel (EPUAP) has identified that these moisture lesions can contribute to the formation of pressure ulcers (DeFloor et al, 2005) and it considers them to be the ulcerations that are most often misclassified.

Faecal incontinence affects about 2% of the adult population on a daily to weekly basis and the prevalence in the over 65-year-olds is 7% with up to one-third of hospitalised and retirement home residents being affected (Kamm, 1998). Infectious intestinal disease increases the likelihood of faecal incontinence and rates of infection by the most common causes — *Clostridium difficile* and Norovirus — in people who are hospitalised have increased in recent years. During this period of increase a new strain of *C. difficile* type 027 has been identified, and is known as a hypervirulent producer making it more virulent than other strains (Health Protection Agency, 2006). The vegetative bacteria of *C. difficile* produces a range of disease severity from mild and self-limiting to profuse and prolonged diarrhoea which can even lead to death. Its ability to cause prolonged outbreaks in communal settings



Figure 1. A moisture lesion.

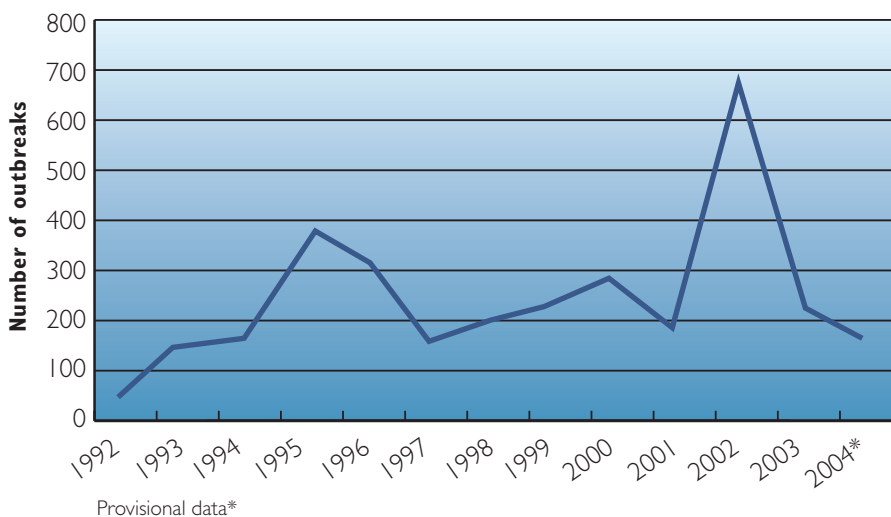


Figure 2. Norovirus outbreaks in England and Wales 1992–2004 (Health Protection Agency, 2004).

is due to its ability to produce spores which are resistant to heat, alcohol and stomach acid. It is the toxins released by the vegetative bacteria that harm the lining of the gut and produce the diarrhoea which in severe cases will include mucus and blood. The spores and the vegetative bacteria are expelled in the diarrhoea.

According to the Office for National Statistics (2007) death certificates recording *C. difficile* in England and Wales increased from 1,214 in 2001 to 3,807 in 2005. The rise was most notable between 2004 and 2005 when the increase was 69%. Two outbreaks at Stoke Mandeville Hospital between 2003 and 2005 involved 334 people with 33 of them dying, and an outbreak in a Kent hospital in April to June 2006 caused 20 deaths (Healthcare

Commission, 2006a). Local North Devon figures (Health Protection Agency, 2007) for the period January–September 2006 show a total of 163 cases with the largest number (86) appearing in the January–March quarter when outbreaks of infectious intestinal disease were at their peak. The figures equate to 3.43 cases per 1,000 bed days occupied by the over-65 years age group. Overall the most common cause of gastroenteritis in England is Norovirus, previously known as Norwalk-like virus (Health Protection Agency, 2004). Disease is sudden in onset and immunity to it is not long lasting. Colloquially it has been termed winter vomiting disease due to its seasonality and its frequent, but not always its first, symptom, however, it appears now to be common throughout the year.

The number of outbreaks of infectious intestinal diseases due to norovirus varies, but is generally between 130 to 250 outbreaks each year. Two distinct peaks of norovirus activity have occurred in England and Wales since 1992: one in 1995–96 with 368 outbreaks, and in 2002 there was an unusually high number of outbreaks (686) that coincided with the emergence of a new variant genogroup II 4 (Health Protection Agency, 2004) (Figure 2).

Investigation

The sudden rise in hospital-acquired pressure ulcers (PU) in North Devon was noted in the first quarter of 2006. This rise in PUs was concurrent with a number of ward-based outbreaks of infectious intestinal disease caused by *C. difficile* and Norovirus. The ward nurse reporting pressure ulcer incidence system, which had been established in 1995 and had run successfully since then, showed an increase from a fluctuating but stable figure of under 2% (quarterly range from October 2004 to December 2005 = 1.7–1.9%) to 2.4% which prompted an investigation into the causation. The 2.4% represented 124 patients acquiring a pressure ulcer in hospital in the January to March 2006 quarter. A retrospective case note review was decided upon in order to determine if any circumstantial link could be identified between this increase and the rise in outbreaks of infectious intestinal diseases.

Method

Names on the outbreak lists and in the pressure ulcer incidence records were compared for the quarter to identify those patients who experienced both diarrhoea and PU. Case notes were gathered and examined to determine the dates of the first occurrence of diarrhoea and PU on the buttocks or sacrum. Case records were also scrutinised for any documented comment, nursing or medical, or any other chart notation suggesting a connection with PU and diarrhoea symptomology. Cases were assigned a 'probable' rating if the date of diarrhoea or faecal incontinence shortly preceded the initial recording of new pressure ulceration (0–4 days inclusive). 'Probable' was also awarded if nursing or medical staff had made an explicit notation of their opinion of a link between the two issues in the case record. Cases were awarded a 'possible' rating if

Table 1

Instructions for ward nurses on the use of skin sealant preparation for patients with incontinence

Using Cavilon for faecal incontinence/diarrhoea:

1. Irregular problem (less than every day) — apply one 2g sachet every two days after washing the skin and patting dry.
2. Regular problem (once a day or more) — apply one 2g sachet every day after washing with a pH-balanced product (spray foam cleansers) designed for skin cleaning.

Using Cavilon for urinary incontinence:

1. Incontinence without skin damage present — apply one sachet every two days.
2. Incontinence with skin damage — apply one sachet every day.

Table 2

Mapping faecal management to Standards for Better Health (DoH, 2006a)

Mapping *Standards for Better Health* — the document which establishes the core and developmental standards for NHS healthcare in England — to the issue of faecal management shows the following excerpts to be relevant:

- » C1a ...make improvement in practice based on local and national experience and information derived from the analysis of incidents
- » C4a ...keep patients... safe by having systems to ensure that the risk of healthcare-acquired infection to patients is reduced
- » D1 ...improve all aspects of their activities that directly affect patient safety...
- » C5c ...clinicians... update... techniques relevant to their clinical work
- D2b Patients receive treatment and care that takes into account their individual requirements and meets their physical... and psychological needs
- C13 Systems in place to ensure that staff treat patients... with dignity and respect

either diarrhoea or incontinence of faeces were noted to have occurred between 5–7 days before the initial recording of the onset of PU. The results of the investigation with any cost calculations were to be taken to the Director of Nursing at the trust in order to discuss options for any actions to be taken.

Results

A total of 23 patients with PU on the buttocks or sacrum appeared on the outbreak and PU listings. Coincidentally this number of 23 exactly represented the percentage increase from 1.9 to 2.4%. Case note review showed faecal attack 'probably' contributed in eight and was 'possible' in six of these cases. Of the eight 'probable' cases, who had nine PU in total, six were of EPUAP grade 2 and two were grade one (there was one missing datum). Of these eight cases six had had *C. difficile* infection and two had Norovirus confirmed by microbiology results. The six 'possible' cases had eight PU in total, of which one was EPUAP grade 4, five grade 2, and two were grade one. Five of these six cases had had *C. difficile* infection and one had Norovirus.

Costs

The dressings and topical negative pressure wound therapy used on the 'possible' case with the grade 4 PU (Figure 3) was costed for the care he had in hospital only which was found to be £3,044.38. Extra bed days resulting from the grade 4 damage were not calculated although it was presumed that a proportion of the 132-day stay resulted from the ulcer. The patient had 39 days of topical negative pressure and calculations of the overall cost of that treatment based on £200 per day (DoH, 2006b) amounts to £7,800. Following discharge to residential care, wound dressings continued for several months continuing to add costs to the patient's overall management bill — possibly as a direct result of the episode of diarrhoea that he experienced.

Discussion

A link between diarrhoea and pressure ulceration/moisture lesions was sufficiently demonstrated at the clinical level to initiate

actions to reduce the risk of future cases arising. The healthcare trust accepted the need to implement skin protection measures for all patients with incontinence (faecal or urinary) using Cavilon Cream (3M Healthcare, Loughborough), a product that had been used for over five years on individual patients with good success. This was costed, if applied as directed (Table 1), at approximately £10,000–£12,000 per annum. The pharmacy agreed to extend this product from a named patient only basis to a routine supply item based on the case produced from the investigation.

In addition to the skin sealant cream, it was agreed with the trust's NHS Supplies department that Flexi-Seal (ConvaTec, Lakenham), a relatively new device on the UK market and new to the wards of North Devon District Hospital would be made available through the tissue viability nursing department to named patients. Flexi-Seal is a rectally-placed conduit for channelling liquid stool and is particularly valuable for the protracted cases associated with *C. difficile* infection. The department would hold a single unit (intensive care would also stock a unit for their own departmental use) and have it replaced by the utilising ward. This would ensure that this product was adequately supervised until its clinical value had been established.

The trust's PU incidence system has been altered following March 2007 to comply with NICE (2005) guidance which requires the reporting of all EPUAP grade 2 and above pressure ulcers as clinical incidents. Changing the system and the method of calculating pressure ulcer incidence figures will be likely to affect the future ability to make true comparisons with earlier figures and to track whether outbreak patterns coincide at similar times

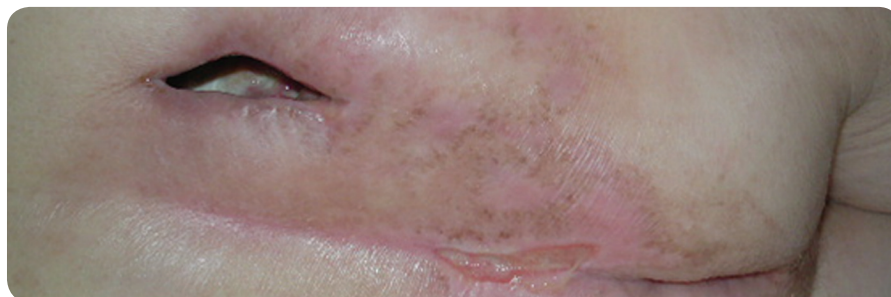


Figure 3. Grade 4 cavitated lesion with improving surrounding skin damage.

Table 3

Core elements of the *Essence of Care* that can be applied to faecal management

- » Contenance, bladder and bowel care
- » Privacy and dignity
- » Personal and oral hygiene
- » Principles of self-care
- » Pressure ulcers

of the year. However, until March 2007 the original incidence system was unaltered. The incidence figure for April to June 2006 was 2.1%, a period when the outbreaks were abating but had not completely stopped, then for July to September they fell to 1.6% which represented the lowest figures on record. This 1.6% figure was sustained in the October to December period but rose again substantially in January to March 2007 to 2.3%, the cause for which has not been determined.

Outbreaks of diarrhoea and pressure ulcers cause significant suffering to patients and disruption to the operational capacity of the NHS. Preventing untoward outcomes in patients is both ethically sound and financially prudent, although a 'spend to save' attitude is required to achieve this benefit. Another operational requirement for trusts is to ensure compliance with *Standards for Better Health* as part of the Healthcare Commission inspection regimen (2006b). Information shown in *Table 2* shows how the issue of faecal management maps to the document, and could form part of a business case for acquiring funds to secure better skin care management materials. The *Essence of Care* (Modernisation Agency, 2003) and the faecal incontinence guideline (NICE, 2007) are important documents which may be helpful in embedding a change to skin care regimens in an organisation (*Table 3*).

Collaborative working between the infection control and tissue viability nurses was able to raise important information on a hitherto hidden problem and create an action plan for change. The infection control team will now be able to document to the infection control committee an additional costly outcome of outbreaks of diarrhoea, that of pressure

ulcers which affect quality of patient care as well as trust performance. **WUK**

References

- Beldon P (2007) The impact of faecal incontinence on wound care. *Continence UK* 2(1): 8–13
- Defloor T, Schoonhoven L, Fletcher J, et al (2005) Statement of the European Pressure Ulcer Advisory Panel — pressure ulcer classification: differentiation between pressure ulcers and moisture lesions. *J Wound Ostomy Continence Nurs* 32(5): 302–6
- Department of Health (2006a) *Standards for Better Health*. DoH, London http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4086665. Last accessed 3rd April 2007
- Department of Health (2006b) Reduce wasted bed days, improve patient care and save money – Hewitt- http://www.dh.gov.uk/en/Publicationandstatistics/Pressreleases/DH_4132360. Last accessed 9th October 2007
- Healthcare Commission (2006a) Healthcare watchdog reveals serious failings in hospital's response to outbreaks of potentially deadly infection. www.healthcarecommission.org.uk/newsandevents/pressreleases.cfm/widCall1/customWidgets.content_view_1/cit_id/4178. Last accessed 3rd April 2007
- Healthcare Commission (2006b) performance against core standards 2006/2007 <http://www.healthcarecommission.org.uk/serviceproviderinformation/annualhealthcheck/qualityofservices/departmentsofhealthstandards/performanceagainstcorestandards.cfm>. Last accessed 9th October 2007
- Health Protection Agency (2004) Norovirus Outbreaks in England and Wales: 2003 and 2004. *CDR Weekly* 14(47):2–5 www.hpa.org.uk/cdr/archives/2004/cdr4704.pdf. Last accessed 9th October 2007
- Health Protection Agency (2006) *Clostridium difficile: Findings and recommendations from a review of the epidemiology and a survey of Directors of Infection prevention and Control in England*. HPA, London www.hpa.org.uk/infections/topics_az/clostridium_difficile/documents/Clostridium_difficile_survey_findings_recommendations.pdf. Last accessed 3rd April 2007
- Health Protection Agency (2007) Quarterly counts of C Difficile (January–September 2006). HPA, London www.hpa.org.uk/infections/topics_az/hai/C_diff_Quarterly_Jan_2007.xls
- Kalenthaler E, Whitfield M, Walters S, Akehurst R, Paisley S (2001) UK, USA and Canada: how do their pressure ulcer prevalence and incidence data compare? *J Wound Care* 10(1): 530–5
- Kamm M (1998) Fortnightly review: Faecal incontinence. *BMJ* 316(7130): 528–32 (cited

Key Points

- » Outbreaks of infectious intestinal disease with *Clostridium difficile* and Norovirus are on the increase.
- » Faecal incontinence can damage the skin.
- » A concurrent rise in pressure ulceration incidence and outbreaks of diarrhoea was observed.
- » Case note review of patients who had pressure ulceration and episodes of diarrhoea linked to outbreak was undertaken.
- » Sufficient circumstantial evidence was found linking diarrhoea to the outcome of skin ulceration and prompted introduction of skin care measures for all incontinent patients.

by www.patient.co.uk/showdoc/40000085/ Last accessed 3rd April 2007

Modernisation Agency (2003) *The Essence of Care: Patient focussed benchmarks for clinical governance*. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4005475. Last accessed 2nd October 2007

NICE (2005) *Clinical guideline: a quick reference guide – The prevention and treatment of pressure ulcers*. NICE, London www.nice.org/CG029

NICE (2007) *Faecal incontinence: The management of faecal incontinence in adults*. <http://guidance.nice.org.uk/CG49/quickrefguide/pdf/English>. Last accessed 2nd October 2007

Phillips L, Busby J (2006) *Pressure ulcer epidemiology in the UK: 2005–2006*. Poster presentation at Wounds UK conference, Harrogate. www.wounds-uk.com

Stephen-Haynes J, Gibson L (2004) *Principles of pressure ulcer management and prevention*. Wound Care Society, Hartford. www.woundcaresociety.com

Office of National Statistics (2007) *Deaths involving MRSA and Clostridium difficile continue to rise* National Statistics News Release 22.2.07. ONS, London. <http://www.statistics.gov.uk/pdfdir/deaths0207.pdf>