Prevention and management of incontinence-associated dermatitis


Abstract
Maintaining skin integrity in people with incontinence is challenging. Incontinence is common in older people and those compromised by medical or surgical comorbidities. Urinary and faecal incontinence can result in skin breakdown, which is characterised by erosion of the epidermis, creating a moist, macerated appearance to the skin. Incontinence and associated skin breakdown can have a considerable effect on an individual's physical and psychological wellbeing. This article discusses the aetiology of incontinence-associated dermatitis and considers the best options for the prevention, management and treatment of this condition.

Author
Alison Bardsley
Senior lecturer in primary care nursing and course director, non-medical prescribing, Faculty of Health and Life Sciences, Coventry University.
Correspondence to: aa8538@coventry.ac.uk

Keywords
Faecal incontinence, incontinence-associated dermatitis, skin, urinary incontinence

Review
All articles are subject to external double-blind peer review and checked for plagiarism using automated software.

Online
Guidelines on writing for publication are available at www.nursing-standard.co.uk. For related articles visit the archive and search using the keywords above.

URINARY INCONTINENCE affects up to six million people in the UK (Irwin et al 2006, National Institute for Health and Clinical Excellence (NICE) 2006), and approximately 1% of adults experience regular faecal incontinence (NICE 2007). However, these figures may be an underestimate as a result of under-reporting owing to the embarrassing nature of the condition. Prevalence of urinary and faecal incontinence increases with age (Goode et al 2005), and a significant number of people are placed in long-term care settings as a result of incontinence (Fonda et al 2004). The risk of skin damage is increased in older people, with incontinence cited as a major cause of skin breakdown, which subsequently affects a person’s physical and psychological wellbeing (Sibbald et al 2003, Farage et al 2008, Price 2009, Walburn et al 2009).

Several studies have considered the psychological and social effects of faecal and urinary incontinence (Broome 2003, Miner 2004, Charalambous and Trantafylidis 2009, Koloski et al 2012), however there is a lack of research on the consequences of incontinence-associated dermatitis (Sibbald et al 2003). Incontinence may be associated with depression, anxiety, loss of self-esteem, embarrassment, shame and avoidance of social interactions, leading to functional impairment (Steers and Lee 2001, Broome 2003, Miner 2004, Yip and Cardozo 2007, Charalambous and Trantafylidis 2009, Koloski et al 2012). Incontinence remains a taboo subject for many. Patients may be too embarrassed to raise the issue with healthcare professionals and may attempt to hide the problem by wearing darker clothing or ‘toilet mapping’ – finding out where all the toilets are located in their area (Ness 2012). During assessment, patients are not always given a specific diagnosis, which can lead to conservative treatment and measures to improve continence not being tried before providing continence aids (NICE 2007, Rasmussen and Ringsberg 2010).

Urinary incontinence is the involuntary loss of urine (Abrams et al 2010). Faecal incontinence is the involuntary loss of liquid or solid faeces (NICE 2007). Incontinence is dependent on a number of factors, including physiological aspects of competent muscles and nerves, and physical issues of mobility and dexterity. In some cases, there is a single causative factor, however for the majority of individuals there are multiple complex contributing factors.

Incontinence-associated dermatitis is the clinical manifestation of moisture-associated skin damage and is commonly experienced by people with...
urinary and faecal incontinence (Gray et al 2007).
The damage is characterised by erosion of the
epidermis and a macerated appearance to the
skin (Gray et al 2007).

Skin structure
The skin is the largest organ in the body,
with multiple functions. It has two main
layers: the thin outer epidermis and the
underlying dermis (Tortora and Derrickson
2012) (Figure 1). The epidermis, in particular
the stratum corneum, provides a protective
barrier against hazardous substances and
pathogens, as well as a moisture barrier, which
prevents excess fluid gain and loss from the
body (Voegeli 2012). The normal pH of the
skin is between 4.5 and 6.2, so is acidic. The
acid mantle on the surface of the skin provides
a barrier to bacteria, viruses and other potential
contaminants. Since many contaminants and
other chemicals are primarily alkaline in nature,
the skin’s acidity helps to neutralise any
damaging effects.

Simple models of the stratum corneum
suggest a ‘bricks and mortar’ configuration,
with protein-rich corneocytes acting as bricks
held together by a lipid-rich matrix mortar
(Cork 1997). Corneocytes are non-viable
disk-shaped horny cells mainly composed of
keratin (Casey 2002). The action of enzymes
on phospholipids in the epidermis produces
a mixture of ceramides, free fatty acids and
cholesterol that cements the corneocytes together
(Harding 2004). Some of these lipids have a hard
crystal structure, making them impermeable to
water. Lipids without this structure allow water
to percolate through, making the epidermis
semi-permeable. The corneocytes contain
substances that attract and hold water,
collectively known as natural moisturising
factor. The increase in intracellular water helps
corneocytes to retain their turgidity and shape,
therefore maintaining the barrier properties
of the skin. This also helps to keep the skin
hydrated, enhancing its flexibility and elasticity
(Harding 2004).

The harmful effects of water on the skin
are well known. Prolonged contact with
water is known to be a factor in the
development of irritant contact dermatitis
(Meding 2000). If the moisture content of the
skin is too high or too low, barrier properties
of the skin may be affected. When the skin is
dehydrated, corneocytes do not shed as normal
and the skin becomes rough, thickened and
flaky, eventually cracking because of a loss of
elasticity. Excessive moisture or overhydration
of the skin allows the passage of irritants
through the skin barrier, precipitating
inflammation and leading to dermatitis
(Voegeli 2012). Wetness also has the effect
of macerating the skin, increasing the risk of
damage from friction (Mayrovitz and Sims
2001). Skin overhydration can be caused by some
skin cleansing methods and excessive washing
(Ersser et al 2005). Incontinence-associated
dermatitis typically presents as inflammation
of the skin, redness and, if left untreated, severe
swelling and blisters.
Incontinence-associated dermatitis
Inflammation and erosion of the skin caused by prolonged exposure to various sources of moisture, including faeces, urine, perspiration and wound exudate, is known as incontinence-associated dermatitis (Gray et al 2011). Individuals of all ages can experience incontinence-associated dermatitis and while skin can become damaged for many reasons, one of the main risk factors is faecal and/or urinary incontinence (Copson 2006).

The prevalence of incontinence-associated dermatitis varies between 3.4% and 25%, depending on the care setting and population studied (Beeckman et al 2010). Approximately 50% of people with urinary or faecal incontinence are affected by incontinence-associated dermatitis (Gray et al 2007). However, it is likely that figures for this condition are underestimated because of the absence of validated assessment and recording tools (Borchert et al 2010).

As previously mentioned, incontinence-associated dermatitis is part of a larger aetiological framework termed moisture-associated skin damage, which includes (Gray et al 2011):

- Intertrigo – inflammation in skin folds related to friction, perspiration, and bacterial and/or fungal bioburden.
- Peri-wound maceration – skin breakdown caused by wound exudate.

Age is also a risk factor. As the skin ages, the epidermis thins and a reduction in contact between the epidermis and dermis layers leads to a reduction in available nutrients, with the skin becoming more prone to shearing and friction (Rees and Pagnamenta 2009).

Urine and faeces contain a variety of chemical irritants, as well as moisture, which can result in incontinence-associated dermatitis (Langemo et al 2011). Although there are some generally accepted theories about how incontinence-associated dermatitis occurs (Gray et al 2007, Beeckman et al 2009), none are definitive and it is possible that the cause in most patients is multifactorial. Histological studies have demonstrated that incontinence-associated dermatitis could be the result of disruption of the intracellular lipid-rich mortar and corneocytes in the stratum corneum, effectively dissolving the skin’s physical barrier (Warner et al 2003).

Urine and faeces convert urea to ammonia which, although only a mild irritant itself, can destroy the skin’s acid mantle when combined with faecal urease. The presence of urine and/or faeces makes the skin’s pH more alkaline, activating proteolytic and lipolytic enzymes that cause skin irritation and breakdown (Langemo et al 2011).

Risk assessment
Identifying individuals at increased risk of developing incontinence-associated dermatitis is important to ensure timely implementation of preventive measures. The Perineal Assessment Tool (Nix 2002) aims to determine the risk of perineal skin breakdown in the presence of incontinence. In the tool, risk factors form subcategories dependent on the degree of risk associated with perineal skin breakdown.

The subscales are scored from 1 (least risk) to 3 (most risk), with overall scores ranging from 4-6 (low risk) to 7-12 (high risk).

Patient assessment
It is important to differentiate between incontinence-associated dermatitis and the development of superficial pressure ulcers. Incorrect assessment can lead to inappropriate treatment, suboptimal care, prolonged hospitalisation and increased costs (Beeckman et al 2010). The European Pressure Ulcer Advisory Panel (EPUAP) and National Pressure Ulcer Advisory Panel (NPUAP) (2009) have produced guidelines to assist practitioners in differentiating between incontinence-associated dermatitis and pressure ulcers, with the aim of providing appropriate care and treatment.

One important differentiating factor is the location of skin breakdown. In general, pressure ulcers are located over bony prominences such as the coccyx, whereas incontinence-associated dermatitis can occur over any part of the perineal area. Pressure ulcers also tend to be localised, involve full or partial-thickness tissue loss and have well-defined wound margins (EPUAP and NPUAP 2009). Incontinence-associated dermatitis involves moisture, and tissue involvement tends to be superficial, involving only the epidermis and upper dermal layers. Incontinence-associated dermatitis tends not to be localised, with the edges of lesions usually irregular and the surrounding area reddened as a result of the irritating nature of incontinence (Beeckman et al 2010).

A useful visual skin assessment tool – the Skin Excoriation Tool for Incontinent Patients – is provided by the National Association for Tissue Viability Nurses (Scotland) (2009). The tool can aid practitioners in the assessment of the skin and determining appropriate treatment.

Prevention and management
Since the main causative agent for incontinence-associated dermatitis is moisture,
the main preventive measure involves avoiding excessive contact with moisture on the skin. A continence management plan should be implemented that highlights the importance of identifying and preventing associated skin complications. Maintaining adequately hydrated skin is also essential to prevent the skin losing elasticity and cracking. Four main goals for managing incontinence-associated dermatitis have been identified (Gray et al 2011):

- Adapting a structured skin care regimen.
- Use of products (continence aids) that wick away moisture from the skin.
- Control of excessive moisture.
- Treatment of secondary infection.

It is not within the scope of this article to discuss all aspects of management in detail, however an overview of a skin care regimen and use of incontinence products follows.

**Skin care regimen**

In a review of the prevention and treatment of incontinence-associated dermatitis, Beeckman et al (2009) highlighted the importance of optimal skin care following each episode of incontinence, particularly where faecal matter is present. The review demonstrated that a structured care plan combined with a pressure ulcer prevention protocol significantly lowered the incidence of incontinence-associated dermatitis from 25.3% to 4.7% (Beeckman et al 2009). A skin care regimen comprising gentle cleansing, application of moisturiser and, if required, use of a skin barrier protecting agent should also be included (Beeckman et al 2009).

Many soaps and cleansers are alkaline, with a pH around 9, and when used routinely to cleanse the skin of patients with incontinence these can alter the skin's acid mantle (Kirsner and Froelich 1998). Several studies suggest that cleansers with a pH as near as possible to that of the skin's acid mantle, containing a moisturising product, emollient or humectant, should be used (Ananthapadmanabhan et al 2004, Voegeli 2008, 2012, Beeckman et al 2010). Moisturisers help to restore the function of the epidermis by covering tiny fissures, providing a soothing protective film and increasing the water content of the epidermis. Emollients, which are mainly lipids and oils, improve repair, permeability and hydration of the skin. Humectants enhance water absorption from the dermis into the epidermis and may also have emollient properties.

Barrier products form part of a protective skin care regimen (Nix 2006). They are not required for every patient and should only be used for those identified at increased risk of incontinence-associated dermatitis. Barrier preparations contain water-repellent substances, for example dimethicone, which is generally inert and non-toxic (British National Formulary 2012). The liquid polymerises to form a thin, transparent, flexible barrier on contact with the skin and is usually breathable. Barrier products can be used on unbroken skin as a prophylactic and on broken skin to aid protection of adjacent skin (Voegeli 2012).

Any cleansing or barrier products should always be for single patient use only to prevent cross-infection. Therefore, sprays and tubes may be more appropriate than pots of cream.

Healthcare professionals should aim to prevent incontinence-associated dermatitis through implementation of an appropriate skin care regimen involving gentle cleansing, application of moisturiser and, if required, use of a skin barrier product (Langemo et al 2011). Where skin breakdown has occurred, a review of the skin care regimen is required.

**Incontinence products**

There are many products available for patients with incontinence. A full explanation and review of incontinence products is beyond the scope of this article, however a brief overview follows.

For men where there is no faecal incontinence, a sheath system may be an appropriate and dignified option. Sheath systems work well if fitted and managed correctly, and individuals can often self-manage (Williams and Moran 2006). For female patients and those with double (urinary and faecal incontinence) or faecal incontinence the choice is limited to absorbent incontinence pads. An appropriate incontinence product is one that ensures skin integrity is maintained (Brazzelli et al 2002, Lekan-Rutledge et al 2003). Selection should take into consideration a number of factors (Brazzelli et al 2002, Fader et al 2008a).

**Level of absorbency**

The amount of urine absorbed by the product without leaking is referred to as level of absorbency. The wicking quality of incontinence products means that the urine is trapped within the product and will not be released if the patient sits or lies on the product. The level of absorbency required by an individual will depend on the type of incontinence (Fader et al 2007, 2008b).
Frequency of changes
The frequency with which disposable products can be changed in the community setting will often determine the level of absorbency required. For patients in the community where a care package is in place, a higher absorbency product may be required to accommodate the frequency of care visits and/or availability of carers. If the product can be changed more frequently, smaller less absorbent and more discreet products can be used. Booster pads are a useful aid for individuals with small amounts of faecal incontinence, as these are relatively cheap and can be changed frequently without having to discard the larger product (Fader et al 2007, 2008b).

Cost
When assessing the overall cost of products, it is necessary to take into consideration the frequency of changes required, and the effects and risk of incontinence-associated dermatitis. In some cases, using a more expensive but more absorbent product that does not need to be changed as frequently will save money. Reusable and machine-washable, waterproof, absorbent underwear can be used to preserve the environment, while reducing costs (Fader et al 2008b).

Size
There are disposable products to fit all individuals, and the patient should be measured before organising supplies. Ill-fitting products, especially around the legs, groin and waist, can lead to leakage (Fader et al 2007, 2008b). When urine or faecal matter leaks onto the skin, the risk of incontinence-associated dermatitis is increased.

Figure 2 shows a patient who fell downstairs and was not discovered until the morning. The picture shows the area where the incontinence product protected the skin. Excoriation can be

References


seen around the edges of the shape of the product caused by leakage. Therefore, it is essential to select an appropriately sized product for the patient.

**Conclusion**

Incontinence-associated dermatitis is a common, painful and distressing condition encountered in many different patient groups and care settings. Careful risk assessment of patients is essential to ensure optimum preventive measures are employed, and if incontinence-associated dermatitis occurs, the most effective treatment interventions are implemented. A structured skin care regimen to cleanse, protect, remove excess moisture and treat secondary infections should be adopted. Good essential nursing care can improve the patient experience, clinical outcomes and quality of life.