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Article in *British Journal of Community Nursing* · August 2011

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Incontinence-associated dermatitis: step-by-step prevention and treatment

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Incontinence is a widespread problem in community dwelling adults (Macmillan et al, 2004; Du Moulin et al, 2008). Studies on the prevalence of urinary/faecal incontinence in these patients have produced various figures, mainly attributable to the type of population and the study protocol used. With prevalence estimates between 10–15% for faecal incontinence (Macmillan et al, 2004; Shamliyan et al, 2007) and up to 46% for urinary incontinence (Du Moulin et al, 2008), it is clear that incontinence care is an important task for clinicians in this area.

The aim of this practice-focused article is to provide a brief update about the evidence of:

- ♦ The pathophysiology of IAD
- ♦ The differentiation between IAD and pressure ulcers
- ♦ The prevention/treatment of IAD.

Specific recommendations for patient care in the community will be described and linked with the fictitious patient case of the 74-year-old Mrs Smith.

Defining perineal skin breakdown

Incontinence can lead to numerous complications. One of the most common complications is perineal skin breakdown (Gray, 2010; Langemo et al, 2011). The terminology used to describe perineal skin breakdown caused by incontinence is heterogeneous and rather confusing; more than 18 different terms occur, ranging from incontinence-associated dermatitis to skin maceration, perineal dermatitis, incontinence

dermatitis, diaper dermatitis, napkin dermatitis, napkin rash and napkin erythema (Beeckman et al, 2009). The taxonomy used to describe this clinical condition focuses on one of four main aspects:

- ♦ Clinical appearance (e.g. maceration of the skin)
- ♦ Cause of the irritant (e.g. incontinence lesion)
- ♦ Location of the skin breakdown (e.g. perineal dermatitis)
- ♦ The material causing the skin breakdown (e.g. diaper dermatitis).

In 2007, a consensus group advocated the term incontinence-associated dermatitis (IAD) for the reactive response of the perineal skin to chronic exposure to urine and faeces (Gray et al, 2007).

Incontinence-associated dermatitis: a problem in the community?

Little is known about the prevalence or incidence of IAD in the community. Bliss et al (2008) reported IAD in 50% of a group of 185 community-living adults with urinary incontinence, faecal incontinence or double faecal and urinary incontinence. It is estimated that IAD affects as many as 41% of adults in long-term care (Nix and Haugen, 2010). The reported prevalence of IAD in the acute care setting varies from 20% to 27% (Junkin et al, 2005; Junkin and Selekof, 2007), and the reported incidence in a long-term acute care facility over a 12-week period in the United States is 22.8% (Arnold-Long, 2011).

The prevalence of IAD in the critical care setting appears even higher; reported estimates vary from 36% to 50% in patients who are not on a defined preventive skin care regimen (Driver, 2007; Bliss et al, 2011). It is likely that the prevalence of IAD is underestimated due to the absence of validated instruments for evaluating its presence (Borchert et al, 2010). Gray et al (2002) have reported that approximately one in three patients with faecal incontinence develop IAD.

Case study: Mrs Smith

The 74-year-old Mrs Smith spent several weeks in hospital after hip replacement surgery. She was rather depressed since the loss of her husband six months ago. Since admission to hospital, she became incontinent of both urine and faeces. She often experiences episodes of diarrhoea requiring frequent pad changes. Mrs Smith returned home last month

ABSTRACT

Incontinence-associated dermatitis (IAD) is one of the clinical manifestations of moisture-associated skin damage. It is a common problem in community dwelling patients with faecal and/or urinary incontinence, and IAD management is an important challenge for community nurses. The aim of this practice focused article is to provide a brief update about the evidence of: (1) the pathophysiology of IAD, (2) the differentiation between IAD and pressure ulcers, and (3) the prevention/treatment of IAD. Recommendations for patient care in the community is described with reference to a patient case study.

KEY WORDS

Urinary catheter ♦ Incontinence ♦ Incontinence-associated dermatitis ♦ Prevention ♦ Treatment ♦ Pressure ulcer



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Figure 1. The clinical appearance of incontinence-associated dermatitis.

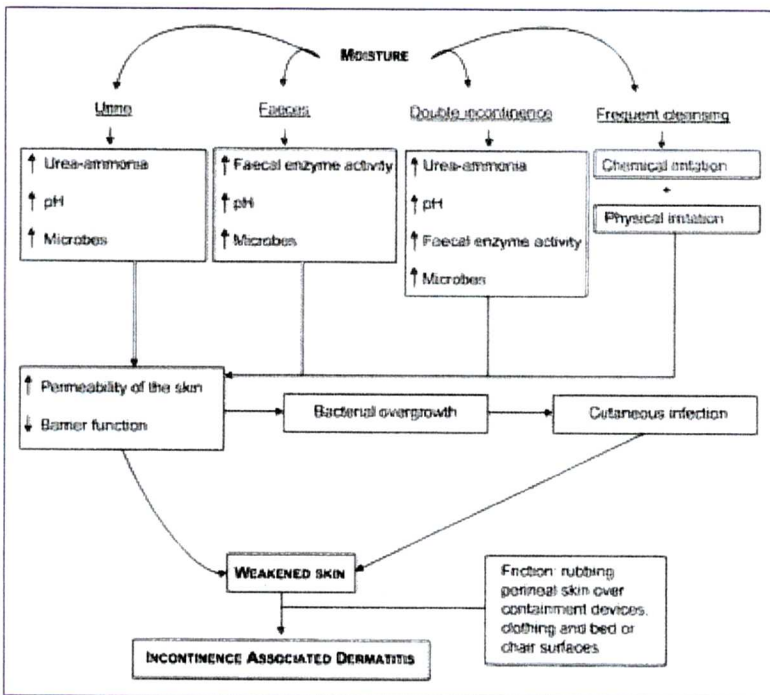


Figure 2. The pathophysiology of incontinence-associated dermatitis (Adapted from Beeckman et al, 2009).

and she is recovering well from her surgery, but she continues to experience both urinary and faecal incontinence and has persistent bouts of diarrhoea.

Mrs Smith is able to make short walks around the house with the support of her physiotherapist and her daughter, and she particularly enjoys spending time in the garden. Although she maintains a normal body weight, her eating and drinking habits are inadequate. The community nurse visits Mrs Smith on a daily basis to support her with basic hygienic care (washing and dressing).

Two weeks ago, the community nurse observed redness of Mrs Smith's perineal and perianal skin, her buttocks, and the medial aspect of her left upper thigh. The affected skin

appeared to be wet and shiny. The lesions were superficial, diffuse, and multiple superficial spots could be observed. The edges were diffuse and irregular. The redness was not uniform, varying from different tones of redness to pink. Mrs Smith had to scratch regularly because of itching and burning.

The community nurse reported the manifestation of a superficial pressure ulcer and started pressure ulcer prevention immediately. She recommended Mrs Smith to purchase a memory foam mattress to be placed in her bed. She washed the perineal skin daily using water and soap. She dried the skin by towel patting. She asked her daughter to wash the skin after each period of faecal/urine incontinence using water and soap. Wound treatment was started by applying a hydrocolloid dressing.

Today, after two weeks of intensive treatment, the size of the lesion has increased significantly. The redness of the surrounding skin became more intense (see Figure 1). The patient and family are uncertain about the diagnosis and the appropriateness of the actions taken by the community nurse.

The pathophysiology of IAD

The process of IAD development in Mrs Smith is complex and involved the interaction of moisture (water and chemical substances within urine/faeces) and friction (physical irritation) with the normal physiology of the superficial skin layers:

- The incontinence had a negative impact on the water balance and the lipid structure within the outermost layer of the epidermis (stratum corneum). Water and lipids are both essential components of the barrier function of the skin (Newman et al, 2007). In a normal skin, the stratum corneum contains approximately 15% water and 15% lipids. However, in elderly patients such as Mrs Smith, the volume of water can decrease to less than 10% (Newman et al, 2007).
- The chemical irritants within the urine/faeces (such as urea and faecal enzymes), the pH, and mechanical factors (such as friction) had a negative impact on the lipid structure of the stratum corneum, and thus a reducing effect on the skin's barrier function (Korting and Braun-Falco, 1996; Gray, 2010). The increased pH caused the stratum corneum to swell and to change in lipid rigidity. This resulted in an increase of the skin permeability and a reduction of the barrier function. Moreover, the increased skin pH will have caused her skin to become more alkaline, thus raising the risk of colonization with coliform bacteria.
- Friction (physical irritation) occurred as a result of perineal skin rubbing over her clothing, incontinence pad, and bed/chair surfaces.

The negative impact on the water balance and the lipid structure, exposure to chemical irritants within the urine/faeces, and the friction associated with chronically moist skin led to development of IAD (Beeckman et al, 2009). (Figure 2).

Differentiating IAD from pressure ulcers

The differentiation between IAD and pressure ulcers is known to be a common problem in clinical practice (Defloor and Schoonhoven, 2004; Beeckman et al, 2007). In our case study, IAD was diagnosed incorrectly as a superficial

Table 1. Synthesis of the EPUAP position statement on pressure ulcer classification and IAD differentiation

	Pressure ulcer	Incontinence-associated dermatitis (IAD)
Cause	Pressure and/or shear must be present	Moisture must be present (e.g. shining, wet skin caused by urinary incontinence or diarrhea)
Location	A wound over a bony prominence is likely to be a pressure ulcer	IAD may occur over a bony prominence. However, pressure and shear should be excluded as causes, and moisture should be present
Shape	If the lesion is limited to one spot, it is likely to be a pressure ulcer	Diffuse, different superficial spots are more likely to be IAD
Depth	Partial thickness skin loss and full thickness skin loss	Superficial (partial thickness skin loss)
Necrosis	A black necrotic scab on a bony prominence is a pressure ulcer grade 3 or 4. If there is no or limited muscular mass underlying the necrosis, the lesion is a pressure ulcer grade 4	No necrosis
Edges	Distinct edges	Diffuse or irregular edges
Colour	If redness is non-blanchable, this is most likely a pressure ulcer grade 1	Blanchable or non blanchable erythema Pink or white surrounding skin due to maceration

pressure ulcer. This finding is in line with a study by Defloor et al (2006), who found that IAD was frequently diagnosed incorrectly as superficial pressure ulcers. No specific figures are available within the community-care setting.

How to observe IAD?

Typically, IAD can be observed as erythema of the skin of the perineum, perigenital area and medial aspects of the upper thigh; it may present with or without areas of skin erosion (Gray et al, 2007; Nix and Haugen, 2010). IAD may also present with a maculopapular rash with satellite lesions caused by cutaneous candidiasis and local symptoms including pain or itching. Defloor and associates (2005) reported that IAD lesions are typically superficial, but may become slightly deeper if they become infected. Nevertheless, the skin damage associated with IAD remains partial thickness, whereas full thickness tissue loss is associated with a pressure ulcer.

IAD vs. pressure ulcers: a mismatch?

Experts agree that IAD can predispose the individual to further skin breakdown and/or pressure ulcer development as a result of pressure or shear. However, IAD represents a separate and unique pathology associated with inflammation when the skin is exposed to urine or faeces, while a pressure ulcer is characterized by ischaemia created when the skin is exposed to excessive pressure and/or shear (Houwing et al, 2007; Gray, 2010). Because pressure ulcers are an important indicator for the quality of nursing care, it is crucial for nurses to accurately differentiate skin lesions as pressure ulcers or IAD. Furthermore, a correct distinction between pressure ulcers and IAD is important because it guides the nurse to put in place appropriate preventive measures.

Education for community practice

In the case of Mrs Smith, a differential diagnosis had to be made based on the cause of the lesion and on objective

wound-related characteristics (such as the location, shape, depth, necrosis, edges and colour of the lesion). Since 2005, important efforts are being made internationally to support clinicians to learn and to improve their knowledge about the distinction between IAD and pressure ulcers. Based on the description of a typical IAD wound and patient-related characteristics, the Pressure Ulcer Classification tool (PUCLAS) was developed (Defloor et al, 2005). This tool was developed by the European Pressure Ulcer Advisory Panel (EPUAP) to teach and learn about pressure ulcer classification and IAD differentiation.

Nowadays, PUCLAS is freely accessible and is widely used for education and in clinical practice (<http://www.puclas.ugent.be/puclas/>). Different studies have provided evidence that PUCLAS is able to significantly improve the health professional's skill in differentiating IAD from pressure ulcers (Beekman et al, 2008; Beekman et al, 2010).

Prevention and treatment of IAD Avoiding progression and skin breakdown

Despite current research on IAD management, current practice in the community may be less than optimal. It is well known that prevention can reduce substantially the prevalence and incidence of IAD (Lewis-Byers and Thayer, 2002); prevention has also been proven to be cost-effective (Ersser et al, 2005; Gray, 2007; Beekman et al, 2009). However, prevention is not an easy task; it requires persistent vigilance from health professionals and family members. This is challenging when guidelines or protocols are not consistent, nurses see their patient only once or twice a day, and family members experience considerable burden caring for their relatives.

In the case of Mrs Smith, it is clear that the focus had to be on diagnosing and treating the minor case of IAD prior to progression and further skin breakdown (Gray, 2010). IAD prevention is based on avoiding or minimizing exposure to stool or urine. For IAD treatment, there must be an additional

focus on the eradication of cutaneous infections, and on the containment or diversion of urine and/or faeces.

A 'step-by-step' approach to skin care

Clinical studies have evaluated interventions for prevention and treatment of IAD which include:

- ♦ Skin cleansing (using perineal skin cleansers, soap and water)
- ♦ Skin protectants (no-sting barrier films, moisturizers)
- ♦ Judicious use of wrap around incontinence devices or underpads.

Limitations of the available evidence indicate a cautious interpretation of the conclusions. However, an increasing amount of evidence draws attention to the importance of a consistent, defined skin care regimen to both prevent and treat IAD. Although studies on the effectiveness of different regimens show extensive variation in their components, all support the use of following step-by-step approach:

- ♦ Step 1: Gentle cleansing of the perineal and perigenital skin
- ♦ Step 2: Application of a moisturizer
- ♦ Step 3: Application of a skin protectant.

Step 1: Gentle perineal cleansing

Gentle perineal skin cleansing involves the use of a product whose pH range reflects the acid mantle of healthy skin (pH between 5.4–5.9). High pH solutions (pH 10.0) can increase stratum corneum swelling and alter lipid rigidity (Korting and Braun-Falco, 1996). Skin cleansers provide an alternative for soap and water to clean the perineal skin.

No-rinse skin cleansers combine detergents and surfactant ingredients to loosen and remove dirt or irritants; many also contain a moisturizing capacity to restore or preserve optimal barrier function. Recent research has demonstrated that they are just as effective as soap and water for removing gram negative and gram positive bacteria from the skin (Ronner et al, 2010). The use of a skin cleanser with neutral or acidic pH may be potentially less damaging to the skin. However, if water and soap is needed to remove dirt or irritants, gentle cleansing is preferred over scrubbing techniques and a soft cloth is recommended to minimize friction damage.

Step 2: Application of a moisturizer

The moisturization of the skin involves repairing the skin barrier, retaining and increasing water content, reducing trans-epidermal water loss, and restoring the lipid barrier's ability to attract, hold and redistribute water (Kraft and Lynde, 2005). Moisturizers contain varying combinations of emollients (substances that smooth the skin and supplement its lipid content), humectants (substances that attract water to the skin) and occlusives (substances that leave a barrier that protects the skin from additional exposure to urine or faeces) to achieve their effects. Lipids are major components of emollients and include fats, waxes, or oils.

The routine use of moisturizers is useful in replacing inter-cellular lipids and maintaining the barrier function of the skin (Kraft and Lynde, 2005; Crowther et al, 2008). However,

it is important to keep in mind that some moisturizer formulations can lead to allergic contact dermatitis, often as a result of preservatives, fragrances or perfumes found within many commercial preparations (Held et al, 1999). Typical symptoms include stinging or burning sensations when the product is applied. Proper knowledge of moisturizers and scientifically based recommendations for the use are important (Flynn et al, 2001).

Step 3: The application of a skin protectant

Many moisturizers are based on occlusive substances, and thus possess, in addition to their moisturizing capacity, a skin protecting function. A skin protectant primarily prevents skin breakdown due to moisture and biological irritants in urine and faeces. Currently used protectants include:

- ♦ Petrolatum-based ointments
- ♦ Dimethicone-based ointments
- ♦ Zinc oxide ointments or creams.

Hoggarth et al (2005) reported that products containing petrolatum demonstrated protection against irritants and maceration and provided some skin hydration. Products containing dimethicone varied in protection against irritants and have good skin hydration potential but lower barrier efficacy. Zinc oxide-based products showed protection against irritants, but poor skin hydration and barrier properties to prevent maceration.

The use of a 3-in-1 product

Multiple products can be used to prevent and treat IAD according to the above three steps. However, numerous studies have shown that a single-step intervention has the potential to maximize time efficiency and to encourage adherence to the skin care regimen (Lewis-Byers and Thayer, 2002; Bliss et al, 2005; Beeckman et al, 2011). These single-step products include disposable washcloths that incorporate cleansers, moisturizers and skin protectants into a single product (Lewis-Byers and Thayer, 2002; Bliss et al, 2005; Beeckman et al, 2011).

Supporting interventions

Supporting interventions include the use of absorptive or containment products and the use of an indwelling device (e.g. urinary catheter or anal plug) in order to restore or maintain skin integrity. However, these interventions should only be considered following detailed continence assessment. The cause of liquid stool should be identified and treated as soon as possible (National Institute for Health and Clinical Excellence (NICE), 2007), as using a device to protect the skin is never as successful as removing the source of the irritation.

Up to 33% of hospitalized patients develop faecal incontinence (Bliss et al, 2000), frequently caused by infective agents such as *C. Difficile*. In our case study, as Mrs Smith has recently been hospitalized an infective cause of the diarrhoea should be excluded. Faecal impaction with overflow should also be considered as a possible cause of Mrs Smith's liquid stool and must be excluded and/or treated. Community nurses should

ensure that they are competent to perform digital rectal examination to assess the presence and consistency of stool within the rectum (Royal College of Nursing (RCN), 2006).

When used correctly, absorptive or containment products comprise an important intervention for preventing or treating IAD and can help to wick liquid away from the skin (Haugen, 1997), although this does not appear to have been effective in Mrs Smith's case. The use of blue incontinence sheets on a bed, as illustrated in *Figure 1*, is inappropriate for the management of either urinary or liquid faecal incontinence and body worn pads should be supplied. Body worn briefs require regular changes to prevent stool being held in contact with the skin and cannot be used if patients have wounds that would be compromised by wearing a pad (Hurnauth, 2011).

External faecal collectors can be used, but these require application of the adhesive to the perianal skin and removal can cause further damage (Scardillo and Aronovitch, 1999). Indwelling faecal management devices have been shown to prevent further deterioration and improve skin integrity in those with IAD (Padmanabhan et al, 2007) by preventing contact of liquid stool with the skin. These devices comprise a long soft silicone cannula, with a low-pressure balloon inflated inside the rectum, attached to a collection bag. While they may be used in critical care settings, they would not be appropriate for use with a mobile, community-dwelling patient.

Anal plugs have been developed for use by patients with faecal incontinence. These can be effective for some, but tend to be better tolerated by patients with poor ano-rectal sensation (Deutekom and Dobben, 2010). Other patients often find the plug uncomfortable to wear, but plugs do allow patients a certain amount of freedom to go about activities of daily living without fear of an episode of faecal incontinence.

Once underlying causes of the faecal incontinence have been excluded, constipating agents such as loperamide may be used to reduce the volume of the stool produced and firm up the consistency of liquid stools. However, there is limited empirical evidence of the effectiveness of these drugs in the treatment of faecal incontinence, nor are they licensed for this indication (Cheetham et al, 2007). The use of a constipating agent, in combination with an evacuation aid (e.g. glycerine suppositories) if required, makes bowel evacuation more predictable and enables it to be planned at a time to suit the patient, their family and nursing staff. This may be a particularly important factor to consider when planning a bowel management programme for patients requiring nursing assistance in the community.

In selected cases, urine may be temporarily diverted from the skin via an indwelling urinary catheter in order to restore or maintain skin integrity. While this may be clinically indicated for IAD, indwelling catheters are not without risk and the risks as well as the benefits of catheterization must be considered in the decision-making process.

There is evidence that up to 25% of catheterizations are unnecessary (Fakih et al, 2010), but it is indicated for management of urinary incontinence as a last resort to prevent and/or treat IAD. There are many complications associated with

catheterisation, such as infection, trauma, pain, urethral erosion, bleeding, latex allergy, blockage, and bypassing. Catheter-associated urinary tract infection (CAUTI) is one of the most serious complications, which affects a significant number of people who are catheterized every year. Up to an estimated 6% of catheterized patients will develop CAUTI (Pellowe and Pratt, 2004) and this is the most common healthcare-acquired infection. If an indwelling urinary catheter is considered appropriate for Mrs Smith, then nurses must do their utmost to minimize the risk of their patient developing a subsequent infection (Department of Health (DH), 2007; Pratt et al, 2007).

If Mrs Smith continues to have episodes of urinary and faecal incontinence following initial treatment then referral to a continence specialist should be considered for assessment and treatment of the underlying incontinence (NICE, 2007). Treatment will depend on the type of incontinence, but may include dietary manipulation, behavioural management, such as pelvic floor muscle training or bladder training programmes.

Conclusion

The prevention and treatment of IAD is an important challenge for nurses and other professionals caring for community-dwelling adults. The case of Mrs Smith illustrated some of the most important problems in daily IAD management: diagnosing and deciding on appropriate prevention and treatment. Systematic reviews depict the lack of evidence-based guidelines for differentiation, prevention and treatment, the plethora of different products, and the lack of evidence about the effectiveness of the available products and interventions. A focus on accurate observation, differentiation, and the development of consistent protocols for prevention and treatment is highly recommended. Appropriate education must be provided to support clinicians in their daily tasks to prevent and treat skin breakdown due to incontinence.

To date, a wide range of locally organized efforts focus on IAD management. The intensity of these initiatives varies significantly between organizations. A more general awareness needs to be generated. Clinical nurse specialists in tissue viability and incontinence must play important roles in leading and developing this area. Clinicians must be aware of the problems related to the multi-component nature of IAD prevention and treatment, with the lack of protocol adherence as the main risk for inappropriate care. It is therefore worthwhile considering a defined skin care regimen that reduces steps or staff time.

Finally, an intensive collaboration between clinicians, researchers and the industry is needed to realize better outcomes for community patients affected with IAD. Such collaboration will benefit the patients (in terms of more consistent care, better information on IAD management options, improved health outcomes), professionals (in terms of more consistent care achieved more rapidly, better use of resources, reduced costs and more patients treated appropriately), and the industry (in terms of better patient understanding, more evidence about their products).

BJCN

Conflict of interest: Dr Dimitri Beekman and Dr Mikel Gray participate as experts in a Clinical Advisory Board for Incontinence-Associated Dermatitis, sponsored by Sage Products, Inc. Cary Illinois, USA.

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LEARNING POINTS

- Incontinence-associated dermatitis (IAD) is a common skin disorder in community dwelling patients with faecal and/or urinary incontinence.
- The Pressure Ulcer Classification Tool (PUCLAS) is effective to learn and teach about IAD
- A structured skin care regimen for IAD management must focus on gentle cleansing, moisturization, and the application of a skin protectant or moisture barrier
- Multi-step interventions may reduce protocol adherence and may be a risk for inappropriate IAD management