

THE USE OF HONEY IN INCONTINENCE ASSOCIATED DERMATITIS

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Maintaining healthy skin is a challenge for people suffering with incontinence and their carers. Healthcare professionals and patients need to take active steps to manage skin care during episodes of incontinence. Skin is particularly at risk in those patients who are older, in poor health, with skin folds, have a poor nutritional intake or are diabetic.

Damage to the skin from incontinence, or incontinence associated dermatitis, can be painful and compromise an individual's quality of life, however, it is avoidable and preventable. Honey offers an alternative natural antibacterial to help maintain the skin's protective layer when incontinence occurs. Honey has been used throughout history in many cultures to treat war wounds and insect bites. In more recent times, honey has proved effective on burns, ulcers and infected surgical wounds.

Structure of the skin and natural skin protection

The skin is the largest organ of the human body and provides a barrier to the environment (*Figure 1*). The skin consists of three main layers, the epidermis, the dermis and the hypodermis. The epidermis is approximately 0.1 mm thick and forms a barrier, protecting the internal organs from physical and chemical attacks and maintaining a well-balanced water content in the skin.

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The dermal layer varies in thickness, from around 5mm in areas such as the back and thighs, to as little as 1 mm in the skin of the eyelids. The dermal layer contains collagen, blood vessels and sweat glands. The collagen within the dermal layer provides the skin with strength and flexibility. As humans age, the production of collagen decreases, leading to wrinkled and sagging skin, increasing the potential of damage from mechanical forces (Newton, 2006). Ageing also decreases the capacity of the skin to heal itself – it becomes drier and has more visible crevices in which bacteria can grow.

Prolonged contact between skin and urine can result in the development of an irritating skin rash or excoriation, termed incontinence associated dermatitis.

The hypodermis (or the subcutaneous layer) lies between the dermis and underlying tissues and organs. It is attached to the dermis by collagen and elastin fibres and is composed of adipocytes, a type of cell that specialises in storing fats.

The effect of incontinence on the skin

The skin's surface has an average pH of 5.5, making it slightly acidic. This acid mantle helps to hydrate the skin, protecting it from drying and from harmful bacteria. The protective acid coating also prevents infection from entering the body by inhibiting the bacterial growth and the action of bacterial enzymes (Rippke et al, 2002). Both urine and faeces are alkaline in nature and on coming into contact with

the skin produce a chemical reaction. When micro-organisms release urea from urine, ammonia is produced, which increases the pH of the skin leading to further irritation (Cooper, 2002). The combination of urine and faeces increases the irritant effect, causing excoriation and skin breakdown.

Due to the combination of moisture, friction and enzyme activity, incontinence can set up a cycle that eventually leads to skin breakdown (Bale, 2005). When people experience incontinence, they often wash to eliminate odour and promote comfort, but also to remove the harmful agents contained in urine and faeces. However, this increased washing also leads to the skin becoming dry and more alkaline and thus its ability to protect against irritant substances is further compromised.

Prolonged contact between skin and urine can result in the development of an irritating skin rash or excoriation, termed incontinence associated dermatitis. Dermatitis is an inflammation of the skin and a term used for any skin rash caused by an irritant substance.

Incontinence associated dermatitis is characterised by inflammation of the surface of the skin with redness, oedema and in some incidences bullae (vesicles) containing clear exudate (Gray et al, 2007). Faeces contains digestive enzymes (proteolytic and lypolytic) used in the digestive process, which are normally deactivated within the bowel to a near neutral pH of 7. However, when faeces and urine mix, the urea in the urine converts to ammonia causing a shift in the pH of both skin and faeces into the alkaline range. This shift allows reactivation of

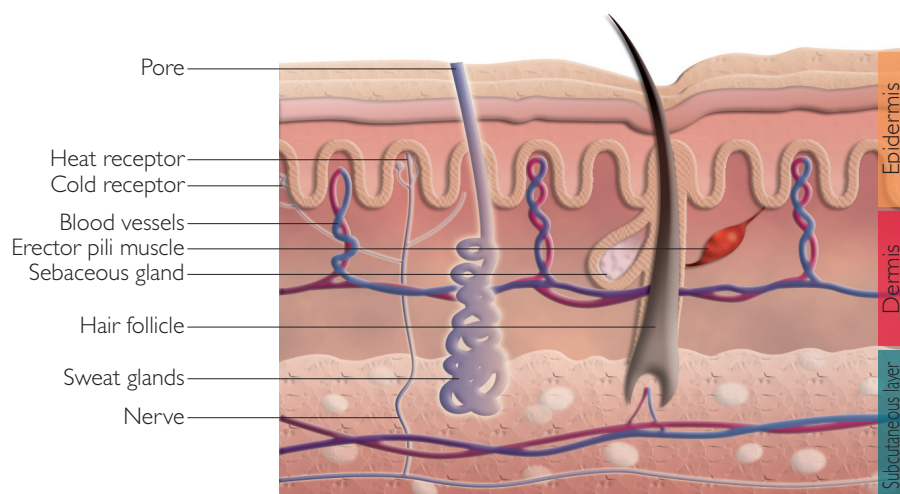


Figure 1: The structure of the skin.

the enzymes within the faeces, which can then attack the skin. Incontinence associated dermatitis is linked to a disrupted acid mantle and these changes in the skin pH become clinically significant as they create a favourable environment for the growth of bacteria, especially *Staphylococcus aureus* and candidiasis (thrush).

The warm damp environment associated with incontinence allows delicate skin to become macerated. In turn, the macerated skin becomes more vulnerable to irritants, such as the chemicals within urine or faeces and may break down. Evidence supports a strong link between incontinence associated dermatitis and the development of pressure ulcers (Bliss et al, 2006; Junkin and Selekof, 2007).

Prevalence

Studies indicate that one in three adults will experience urinary incontinence at some time, while one in 10 will experience faecal incontinence (Perry et al, 2000). There are a limited number of studies reporting the incidence of incontinence associated dermatitis with prevalence rates varying from 5.6–50% in long-term care settings (Gray et al, 2007).

With an increasingly elderly population and the rise of infections such as *Clostridium difficile* causing outbreaks of acute diarrhoea (Department of Health, 2008), there

is the potential for an increase in cases of incontinence associated dermatitis. Maintaining healthy skin remains the most effective defence against invasion of micro-organisms and trauma.

The use of honey in skin care

Honey is a substance produced by bees and stored as a sugar food source. Throughout history, humans have used honey, not only as a food product, but also as a therapeutic aid, especially in wound care. Antibiotic resistance is becoming an increasing problem both within acute and community settings and alongside this there is a growing public

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interest in 'natural' or 'complementary' therapies, which has led to increased professional interest in using skin products that contain honey.

Bees concentrate the dilute sugar solutions they collect from plants and add enzymes, thus, as the honey ripens it is impossible for microbes to grow within it and spoil the stored food (Molan, 2005). Sugar molecules also bind with water molecules, denying the microbes water essential for their

survival. Another enzyme involved is glucose oxidase, which converts some of the glucose to gluconic acid, ensuring that honey is too acidic (with a pH around 3.5) for microbes to thrive in (Molan, 2005).

In some honeys, the glucose oxidase present in fluid such as exudate also produces low levels of hydrogen peroxide, which also enhances the antimicrobial action (Cooper, 2008). All of these factors are useful in suppressing microbial growth when honey is applied to the skin.

Honey also ensures that the wound environment remains moist, which promotes healing, and its high viscosity helps to provide a protective barrier that can prevent infection.

The surface of chronic wounds has been recorded within the alkaline range (7.15–8.9 pH) and the wound surface pH moves from alkaline to neutral and onto acidic as the wound heals (Gethin et al, 2008). Barrier products containing honey help move the pH of the skin from alkaline to acid, reducing the toxicity of bacterial end products (such as ammonia), destroying abnormal wound collagen and increasing the macrophage and fibroblast activity. The result is a promotion of skin healing (Gethin et al, 2008).

Honey contains various nutrients and herbal elements that are found in plants and some of these have antioxidant and antibacterial properties. The floral source of the honey will also affect its antibacterial activity – some honeys, for example, leptospermum honey from Australia and New Zealand, exhibit a significant amount of antibacterial activity that is not accounted for by their high sugar content, hydrogen peroxide production, low water content or low pH (Blair and Carter, 2005).

Dry skin affects 80% of older people and can lead to a less pliable stratum layer, which becomes prone to cracking, flaking and pruritus and subsequently infection (Hess, 1997). The high viscosity of honey provides



a physical barrier to infection and this can be useful in products designed for use with incontinent patients. Barrier products containing honey can moisturise the skin providing a protective layer against the effects of exudate, urine and faeces.

Staphylococcus aureus is responsible for many infections and it is well recognised that the use of topical antibiotic therapy may contribute to the emerging resistance (George and Cutting, 2007). However, studies have demonstrated the antibacterial properties of honey as well as demonstrating that it is effective against multiresistant *S. aureus* (MRSA) (Blair and Carter, 2005).

Honey has also proved effective against *Candida* infection. The incidence of fungal infections is increasing and many species of *Candida* are becoming resistant to traditional triazole-based antifungal therapies (Irish et al, 2006).

Limited studies have also indicated a use for topical honey preparations around catheter-entry sites to prevent infection (Johnson, 2005).

Conclusion

Extra protection is required for people who develop incontinence dermatitis. Good practice requires patients with incontinence to have their skin inspected regularly, gently cleansed

with a pH-balanced cleansing agent and treated with appropriate absorbent products and a topical barrier to protect the skin from moisture and infection (Agency for Health Care Policy and Research, 1996).

With the increasing rise of antibiotic resistance, barrier products containing honey used for patients with incontinence associated dermatitis represents an effective option in the prevention and treatment of skin breakdown and the prevention of infection. **CUK**

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Key Points

- ▶ Maintaining healthy skin is a challenge for people suffering with incontinence and their carers.
- ▶ Healthcare professionals and patients need to take active steps to manage skin care during episodes of incontinence.
- ▶ Skin is particularly at risk in those patients who are older, in poor health, with skin folds, have a poor nutritional intake or are diabetic.
- ▶ Honey has been used throughout history in a wide range of cultures to treat war wounds and insect bites.
- ▶ In more recent times, honey has successfully proved effective on wounds such as burns, ulcers and infected surgical wounds.

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