Adverse reactions to wound dressings

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Since the passing of the Medicinal Products, Prescribing by Nurses Act (1992), the majority of district nurses and health visitors have been able to prescribe selected drugs, dressings and appliances. Hospitals have introduced patient group directives for obtaining wound dressings, and a recent review has extended the scope of nurse prescribing so that in the future, even more nurses will be able to prescribe. Wound care products account for a significant proportion of all prescriptions written. In 1997 the cost of prescribing these products in primary care was estimated to be more than £80 million (DoH 1997). These changes not only broaden access to a range of wound care agents, but also necessitate that the nursing profession keep abreast of the risks associated with their use.

Summary

This article describes the potential risks to patients’ skin from the use of wound dressings and how to minimise those risks. Guidance is provided on the steps to be taken once an allergic reaction is suspected.

Dermatitis

One potential adverse reaction from a dressing or topical agent used in wound care is dermatitis. Contact dermatitis occurs in 1.4 to 5.4 per cent of the population (Williams 1997), and up to 30 per cent of allergic contact dermatitis might be directly attributed to a topical medicinal used in wound care practice (Stone and Powell 2000). However, true prevalence is unknown, as official figures are unavailable and where they do exist are thought to be unreliable. Product manufacturers suggest that assessing causality is virtually impossible. For example, was the reaction due to an allergy, the selection of an inappropriate dressing for the wound, or was it occlusion or inappropriate use of the product? In addition, adverse reactions are under reported, possibly because of limited education and insufficient procedures on how to report these incidents. However, it is important that nurses are able to recognise and understand the cause of dressing reactions because they:

- Can be a cause of delayed or non-healing of a wound (Cameron 1998b).
- Have the potential to affect an individual’s quality of life.
- Can increase the cost of patient care through prolonged treatment episodes and additional product usage. Can undermine the patient’s confidence in the prescriber.

Most information on allergic reactions to dressings and resulting dermatitis concerns patients with leg ulcers (Cameron 1995, Cameron 1998b, Powell 1996). The terms eczema and dermatitis are often used interchangeably to refer to the same skin presentation (Cameron 1998b). However, eczema is used to describe skin changes relating to internal (endogenous) factors as in atopic eczema, and dermatitis is used to describe skin problems relating to outside (exogenous) influences, as in contact dermatitis. Contact dermatitis is caused by direct contact with any external substance that causes a skin reaction, and might be caused by an allergen or an irritant (Ratcliffe 2001).

Allergic contact dermatitis (Figure 1) occurs when an external agent induces an allergic reaction, triggering the production of antibodies. This response is an important part of the body’s defence mechanism. The reaction is delayed, therefore skin changes are not seen on first contact, but occur with repeated application of the allergen. This might happen in 7 days or after prolonged use of a product. The eczema is usually localised to the area of contact, but if the reaction is severe, there can be secondary spread to other areas of the body (Cameron 1998b).

In irritant contact dermatitis (Figure 2), external agents cause inflammation of the epidermis, by chemical disruption of the stratum corneum. The reaction always occurs at the point of contact and there is generally a clearly defined area of erythema, which corresponds to the outline of the dressing. Its severity varies according to the degree of exposure and the nature of the offending substance (Cameron 1998b). Clinical presentation is similar for irritant and allergic dermatitis (Box 1).

Patch testing is often the only conclusive means of establishing if a reaction is allergic or irritant (Ratcliffe 2001). However, because of long waiting times in some areas, referral might only be a feasible
Interrupted barrier function of the skin

One of the main functions of the skin is to act as a protective barrier to multiple external onslaughts. Patients who have had their barrier function disturbed are, therefore, more likely to get a dressing reaction than those who have not. For example, patients with existing inflammation, dryness or excoriation related to eczema or incontinence are more susceptible, as are patients with folliculitis, which is caused by shaving skin before adhesive application or by entrapment of bacteria under an adhesive (3M Healthcare 2001).

Barrier function can also be compromised by exudate, which leaks from the wound onto surrounding skin, leading to a loss of epithelium. This can occur when the wrong dressing product is selected for the amount of wound drainage produced, trapping fluid next to the skin and causing maceration. The occlusive nature of many dressings can exacerbate maceration as they minimise transepidermal water loss (Van der Walk and Maibach 1990). Occlusive dressings also increase the absorption and strength of topical agents, so if the agent is an irritant the damage will be intensified (Rook et al 1998). Furthermore, Zhai and Maibach (2001) describe a study of transdermal patch systems that found that the occlusive environment they created induced irritation in one third of the volunteers tested. However, no irritation was found when a non-occlusive variation of the same product was used (Figure 3).

Risk factors

| Dry/scaling skin | Erythema | Oedema | Pustules | Heat | Itchy inflammation | Exudate | Stinging and burning | Blistering | Formation of vesicles that can crust and weep |

Figure 1. Allergic contact dermatitis

Figure 2. Irritant contact dermatitis surrounding an arterial foot ulcer

Figure 3. Irritation due to occlusion

Box 1. Clinical presentation of irritant and allergic dermatitis

Mechanical injury

Mechanical injury can cause damage to the stratum corneum – the superficial outer layer of the skin. This can be as a result of:

- Stretching and pulling tape too tightly.
- Removing a vapour-permeable film with the wrong technique.
- Skin stepping, which can result from repeated application and removal of tapes and adhesive dressings at the same site (3M Healthcare 2001).
Shear and friction forces, which can cause a dressing to ruck, rubbing the skin.

Advancing age

The skin of older people tends to be dry, papery and vulnerable due to the slowing down of epidermal cell turnover. This means that repair mechanisms are also reduced and recovery from skin damage takes much longer (Zatz 2001).

Potential irritants/allergens in wound care products that are universal to all patients are shown in Box 2.

Reducing the risk of an adverse reaction

This might be achieved by awareness and avoidance of the common allergens and potential irritants that can cause skin damage. However, according to Cameron (1998a), manufacturers are under no obligation to list their products’ contents on the packaging. The Monthly Index of Medical Specialties (MIMS) is a useful reference source of common culprits and where they are found. Patients also need to be educated to avoid using over-the-counter products.

Patient assessment

It is important to identify any past skin problems, including cause, duration and number of episodes. Holistic patient assessment should also include a detailed past medical history, current medication and observation of the periwound area before the application of a wound care product.

To reduce risk factors, patients should be questioned to ascertain any known allergens or if they suspect a previous treatment regimen has caused irritation. For example, some people are allergic to nuts and certain emollients contain peanut oil, and should therefore be avoided in these individuals (Jones et al. 1998).

Appropriate dressing selection

Wound dressings have many components and it is difficult to determine which ingredient is causing an allergic reaction. Therefore, wherever possible, keep the dressing regimen simple. If it is necessary to use a combination of products, manufacturers recommend that practitioners use one company brand, arguing that compatibility tests have only been undertaken with their own products. Theoretically, this might be achieved by awareness and avoidance of the common allergens and potential irritants that can cause skin damage.
Box 3. Examples of dressings/items with a product licence

- Calabarnd bandages
- Inadine
- Aquacel
- Carboflex
- lodoflex
- Terra-Cortril ointment
- Flamazine
- Bactroban ointment
- Metrotop
- Anabact gel
- Calaband bandages
- Tegaderm

Box 4. Examples of dressings/classed as a medical device

- Carboflex
- Granuflex
- Lyfoam
- Kaltostat
- Granuflex
- Inadine
- Tegaderm

Management of adverse reactions

Reporting adverse reactions It is important to report adverse incidents to the relevant monitoring body so that a clear picture can be formed about the safety and efficacy of wound dressings. This might highlight the need to withdraw a dressing or product from use.

There are two methods of reporting adverse reactions to wound dressings. The path taken depends on the status of the product. The dressing might have a product licence (PL).

- Inspect the packaging for a number preceded by the letters PL.
- An adverse reaction needs to be reported to the Committee on Safety of Medicines (CSM) using the Yellow Card reporting scheme. The cards can be found at the back of any British National Formulary, MIMS or from a pharmacy.
- Yellow Cards need to be signed by a doctor or pharmacist before being sent to the CSM, as nurses at present are not recognised reporters of the scheme.
- Examples of dressings/and items with a PL are shown in Box 3.
- There are no markings on the packaging to define this status, but if a PL number is absent, assume that it fits into this category.
- Adverse reactions need to be reported to the Medical Devices Agency (MDA) using their reporting form.
- Anyone can fill in these forms and send them to the MDA. A counter signature is not needed.
- Examples of dressings classed as a medical device are shown in Box 4.
- In addition, send a copy of the Yellow Card or MDA form to the tissue viability nurse (if available), to help with collating information on adverse dressing reactions in hospital and community trusts. Pharmacists should be involved in tissue viability, whether at the adverse reaction reporting level or as part of the multidisciplinary team. Pharmacists can also provide information on wound products, and are valuable in the construction of product formulations. Box 5 summarises the action to be taken in the event of an adverse reaction.

If an allergic reaction is suspected then discontinue the product to allow the skin to recover. All identified manufacturers could absolve responsibility in a case of litigation if products were being used outside their recommendation. This has implications for wound care formulations, where there might be a mix and match availability of dressings, because not all manufacturers provide a product for each dressing group. For example, if a hydrofibre dressing is used in conjunction with an absorbent foam dressing when managing a wound with high exudate levels, and the patient has a reaction, how do you identify which product has caused the reaction or if the reaction has been caused by a certain combination of products? Therefore, it is important to always use products according to manufacturer recommendations. As with drug administration, nurses are responsible for ensuring that they have full knowledge of indications, actions and contraindications of all products used.

Skin cleansing Make sure the skin is clean and dry. However, overuse of soaps and detergents can remove the skin’s natural oils, which will make the skin dry (Boardman 1998). Avoid cleansing with antiseptics, use normal saline for acute and surgical wounds or tap water for chronic wounds (Hollinworth 1998). In addition, gently pat the surrounding skin dry and avoid rubbing, which might cause epidermal damage.

Skin hydration If the skin is dry at the wound perimeter, apply a moisturiser to rehydrate the skin and reduce the desire to scratch. Watts (1996) recommends the use of antihistamines to relieve itching and prevent further skin trauma if emollients alone are not successful in lessening the desire to scratch. Ointments are the emollients of choice, as they are oil based and provide a surface film of lipids. The lipids restore some of the skin’s barrier function, making it less susceptible to the effects of allergens and irritants, and reducing the need for topical steroids (Cork 1998). Ointments have the added benefit that they also contain fewer additives such as fragrances and preservatives, which can cause irritation (Lawton 1996). Select one emollient, as changing emollients can increase the likelihood of an allergic reaction.

Skin protection Use barrier preparations such as zinc oxide to shield the skin surrounding wounds from potential irritants, including bodily fluids and adhesives found in tapes and dressings (Cherry et al 1991). If applying protection to skin that is already broken, opt for protestants that are alcohol-free. Barrier creams have the additional benefit that they moisturise dry skin, while allowing dressings and tapes to adhere.

When removing adhesives from hairy skin, do so in the direction of hair growth and remove by gently supporting the skin. Where possible use porous hypoallergenic tape with minimal adhesive transfer (3M Healthcare 2001).

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or suspected allergens/irritants should be documented in the patient’s notes, which should be accessible to all appropriate members of the multidisciplinary team. These reactions should also be annotated on the prescription chart if used for prescribing dressings. In addition, patients should also be encouraged to keep a list of these sensitisers so that they can report them to healthcare professionals. Cameron (1998a) reports how she developed an allergy alert card for her patients for this purpose.

Apply a topical steroid if appropriate. The starting potency depends on the severity of the dermatitis. It might be necessary to start with a potent steroid, reducing to a weaker formulation. However, remember that occlusion with dressings and bandages increases their potency. Once under control, use a step-down approach to minimise the incidence of a rebound eczema occurring (Cameron 1995). In practice, many healthcare professionals tend to underestimate steroidal applications for fear of inducing side effects, however, thinning of the demarc and vasoinhibition are not associated with 1 per cent hydrocortisone administration. Watts (1996) advocates the use of cream-based vehicles to dry out wet-excoriating areas, and ointments for dry eczema. Hypersecretory to hydrocortisone can occur, so if a reaction fails to improve despite all other appropriate interventions, then this might be the cause.

Avoid tapes to secure dressings or dressings with adhesive borders if the skin integrity is compromised. There are now products on the market such as Mepilex® Border that uses Safetac® Technology. A study by Dykes et al (2001) found this product to have a low peel force, which is associated with a low level of surface skin damage and a relatively low incidence of adverse skin reactions. However, the authors point out that these results were obtained from tests in the laboratory and not on patients with vulnerable skin. If there is a suspected sensitivity to rubber, then the latex gloves worn by the nurse when applying topical medicaments might be a source of irritation and vinyl gloves should be worn as an alternative.

Conclusion

This article has described the potential risks to a patient’s skin associated with the use of wound dressings and how to minimise those risks. Guidance has also been provided regarding the steps to be taken once an allergic dressing reaction is suspected. If the healthcare professional has a suspicion that a topical medicament has damaged a patient’s skin, then it must be reported, even if there is uncertainty as to the cause. Equal emphasis should be placed on the potential for a dressing to cause harm, as well as its ability to promote healing.

REFERENCES