

NON-PHARMACOLOGICAL MANAGEMENT OF ATOPIC DERMATITIS, INCLUDING EMOLLIENTS

WI Visser, MBChB, MFamMed, MMed (Derm)

Correspondence:

Head: Division of Dermatology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University

Email: wvisser@sun.ac.za

ABSTRACT

Atopic dermatitis (AD) is a chronic relapsing inflammatory skin condition affecting approximately 25% of children and 3% of adults. Atopic dermatitis has a major impact on the quality of life of both patients and their families, and this impact may be even more significant than that of many other chronic diseases. Atopic dermatitis is not curable, and constant care and therapy are necessary in order to control the disease. Although numerous medications that treat AD effectively are available, they have a considerable side effect profile and cost implications. Therefore, the management of AD, with safer and potentially more cost-effective non-pharmacological treatment options, needs attention. This article is not a comprehensive review of all of the non-pharmacological measures available for treating AD, but includes the most practical and important options. Occlusive dressings, including the use of "wet wraps", correct bathing practices, the use of antiseptics and antimicrobials, laundry practices, choice of clothing, phototherapy, appropriate use of emollients, psychological measures as well as the education of patients will be discussed. Some of these non-pharmacological treatment options (emollients, correct bathing practices, education) form the cornerstones of AD treatment. Unfortunately, although these treatment options are very effective and widely used, robust data supporting their efficacy and cost-effectiveness is not readily available. Further research in this field should be encouraged, especially in the South African setting.

INTRODUCTION

Atopic dermatitis is a chronic relapsing skin disease characterised by the development of inflammation, xerosis and pruritus.¹ The pathogenesis of AD is a complex interplay between genetic and environmental factors.² It is widely accepted that a defective skin barrier function is central to the development of AD.³

Although pharmacological treatments (topical and systemic medications) are very effective in the treatment of AD, they do have a considerable side-effect profile. Physicians are usually well-informed about pharmacological treatments but less aware of the vast array of non-pharmacological management options available for AD.¹ These measures are usually much safer and are potentially more cost-effective.

The purpose of this article is not to provide a comprehensive overview of all non-pharmacological therapies available for AD, but rather to discuss those non-pharmacological therapies that may be of practical use.

OCCLUSIVE DRESSINGS INCLUDING 'WET WRAPS'

Occlusive dressings involve the use of bandages on areas of dry or eczematous skin, in order to enhance the effect of topical preparations. Occlusive dressings, either wet or dry, may be beneficial in the overall management of AD.⁴ Wet wraps entail the application of a topical medication and/or an emollient to damp skin. This is then covered by a layer of wet gauze, bandage or clothing. A dry layer of gauze, clothing or bandage is applied over this. The bandages are left in place for 8-24 hours¹.

Occlusive dressings were first introduced in 1991 by Goodyear. The benefits of occlusion include cooling of the skin, physical protection against scratching, better hydration of the skin and enhanced penetration of topical medication.⁴ It has also been shown to improve the epidermal barrier function of the skin.⁵ There are problems associated with wet wraps. The application is time-consuming, there is a risk of enhancing the topical and

systemic side-effects of topical steroids, and there is a higher risk for the development of skin infections, specifically bacterial folliculitis. A critical literature review on the use of wet wraps in children with severe and/or refractory AD found that it was difficult to compare studies due to the lack of uniformity in the methodology of these studies. The conclusion nevertheless was that wet wrap therapy was effective for the short-term treatment of children with severe or refractory AD, not responding to conventional treatment with topical steroids. Wet wraps seem to be more beneficial when they are combined with topical steroids rather than with emollients alone. Wet wraps can be safely used for up to 7-14 days and may even be steroid-sparing. Most studies do not include adults or adolescents. There is a potential risk for the development of striae during puberty, if topical steroids are used under occlusion.⁶ In patients with mild to moderate AD, wet wraps do not seem to be beneficial when compared with conventional therapy.⁷

Dry occlusion in AD is much less studied than wet wraps. Dry occlusion can be used alone or with topical steroids. Infective side effects, such as folliculitis, are less likely when dry occlusion is used in conjunction with topical steroids, when compared with wet wraps or dry occlusion alone. Dry occlusion seems to be more beneficial in the management of chronic lesions of AD, although its superiority over conventional treatment is not proven.⁴ In summary, occlusive dressings should be reserved for patients with severe and refractory AD, and never used as first-line treatment. Occlusive dressings should also never be used on infected skin.

BATHING PRACTICES

Due to the higher levels of *Staphylococcus aureus* on atopic skin, bathing and washing is important to remove bacteria from the skin. In order not to cause any further damage to the skin barrier, the correct bathing practices should be enforced in all patients. Although all of these practices have not been substantiated by high-quality clinical trials, they are uniformly accepted as one of the cornerstones of the treatment of AD.

Water dehydrates the skin, and soaps and detergents can influence the pH, thus affecting the barrier-function of the skin. Soaps and detergents are also known to trigger AD flares. Both the National Institute for Health and Clinical Excellence (NICE) guidelines⁸ and the American Academy of Dermatology (AAD)⁹ have information available on bathing practices on their websites.

Emollients or soap-free wash products should be used when bathing or showering. Patients should refrain from using shampoo or bubble bath in the bath. Hair should not be washed in the bath and a shampoo that is unperfumed and suitable for eczema patients should be used.⁸ Bathing or showering only once a day, for no longer than 5 to 10 minutes, is important. The temperature of the water should be lukewarm. Hot water will increase the itch response. General advice regarding bathing practices in AD patients can be seen in Table I.

Table I. Bath tips in atopic dermatitis - adapted from American Academy of Dermatology (AAD) website

- Bath in warm — not hot — water.
- Limit your bath to 5 or 10 minutes.
- Use a mild and fragrance-free cleanser.
- Do not use bubble bath.
- After bathing, gently pat skin dry.
- Apply moisturizer and medicine when the skin is almost dry.

Healthcare workers should bear cultural differences in bathing practices in mind and address these when counselling patients.⁸

It is also important to note that the benefit of adding bath emollients to the bath is still debated,¹⁰ and can potentially add extra cost without clear advantage.

Salt water baths are considered, by some physicians, to be beneficial in the management of AD. This is because salt water has potential antiseptic properties. Unfortunately, there is no randomised controlled study showing clear benefit of salt water baths over ordinary baths.¹¹

There are, however, recent studies showing effective treatment of AD with climatotherapy, warm weather at the Dead Sea¹² and the beneficial effects of salt water bathing in combination with phototherapy.¹³ It is likely that the combination of sunlight, relaxation and salt water was responsible for the clinical improvement in these patients.

ANTISEPTICS AND ANTIMICROBIALS

The skin of AD patients is often heavily colonised with *Staphylococcus aureus*, but the exact influence of these bacteria on AD is not clear. Atopic skin with active dermatitis will be colonised in 90% of cases, while areas without active dermatitis will be colonised in 75% of cases. In comparison, individuals with normal skin only exhibit

colonisation with *Staphylococcus aureus* in 30% cases. The density of *Staphylococcus aureus* colonisation also increases with the severity of the eczema.¹¹

Whether these bacteria play a direct role in the pathogenesis of AD is unclear. It is important to note that there is a difference between skin colonisation and secondary infection by *Staphylococcus aureus*. Active infection with *Staphylococcus aureus* can lead to AD flares, and consequently, it is particularly important that all patients with overt clinical skin infection should be treated with appropriate antibiotics. Skin swabs are only of value if infection with bacteria other than *Staphylococcus aureus* is suspected. Patients should be made aware of the clinical signs of secondary bacterial infection, namely yellow crusts, pustules, blisters, sudden flare of eczema, and systemic symptoms. They should contact their health care provider immediately. Patients should also be aware that containers of creams can become contaminated by infected skin and should be replaced.⁸

In contrast, the treatment of AD uncomplicated by infection with antimicrobials and antiseptics either topically as a bath supplement, or systemically, is not beneficial. This has been confirmed by a recent Cochrane review.¹⁴ Furthermore, topical antiseptics also commonly cause irritant reactions. The use of topical antiseptics should only be considered in patients with recurrent bacterial infections. They should be used in the correct dilution and only for short periods of time.⁸ Topical steroids alone are effective against skin colonisation with *Staphylococcus aureus*.¹¹

The use of anti-fungal creams is not beneficial in the treatment of AD. The short-term intermittent use of mupirocin was shown to have some benefit, but there is concern about the development of resistance.¹¹

Recently, the use of diluted "bleach baths" has been widely advocated.¹ This practice was first described in 2009 and involves the addition of half a cup of 6% bleach to a full bathtub. The patient baths in this diluted bleach mixture for 5-10 minutes twice a week.¹⁵ The concentration should not be higher than described, due to the risk of an irritant reaction. Dermatologists who use "bleach baths" in daily practice report an improvement of eczema and a decreased risk of secondary infection. Although evidence for this intervention is currently not sufficient,¹⁴ it appears to be a promising modality in the management of AD. This may provide an easy, low risk and cost-effective way to manage patients with a tendency to develop recurrent skin infections.¹

LAUNDRY PRACTICES

Evidence of benefits from specific laundry practices in the improvement of AD is limited.¹⁶ The general approach is to advise patients to wash clothes and bedding with mild detergents that do not contain irritants or allergens. Specific or specialised washing powders are unnecessary. The use of fabric softeners is advisable because skin irritation is reduced.

CLOTHING

The use of wool, cotton and silk clothing in AD will be discussed elsewhere in this journal.

Due to the fact that *Staphylococcus aureus* may worsen and trigger eczema, there have been a number of studies experimenting with silver-coated textiles. Silver acts as an antibacterial agent, and may theoretically be beneficial in the management of AD.¹⁷ Although all these studies showed an improvement in eczema severity, the number of patients were limited.¹

This specialised clothing is currently very expensive, and before it is routinely advised, more substantial evidence of its benefit, must be sought.

There are no studies examining the use of specialised clothing in South-Africa. The high temperatures experienced in Africa, will most probably influence the practicality and effectiveness of these forms of clothing.

PHOTOTHERAPY

Phototherapy is an excellent second-line therapy for patients with AD, who cannot be controlled with topical therapy alone.⁸ Phototherapy is immuno-suppressive, and acts by influencing Langerhans cell and eosinophil function, as well as cytokine production in AD patients.^{18,11} The use of narrow-band UVB, by increasing vitamin D synthesis, may possibly also improve AD.¹

All types of phototherapy, including UVA1, narrow-band UVB (NBUVB) and PUVA, namely psoralen plus UVA, are effective in the treatment of AD.¹⁹ It seems that UVA1 therapy is more beneficial in the treatment of acute eczema. Medium-dose (50J/cm²) is sufficient. A clinical response is usually seen within 2 weeks; however, the therapeutic effect is usually short-lived, in the order of 2-3 months.¹⁹ Currently, NBUVB has largely replaced other forms of UV-therapy, being more accessible, more cost-effective and safer. Narrow-band UVB is effective in both adults and children with AD. A recent study confirmed the efficacy and prolonged duration of response, 6 months of NBUVB

in children with moderate to severe AD following 12 weeks of therapy. There was improvement in objective scoring as well as in the quality of life.²⁰

NBUVB is safe, with minimal side effects, and low risk for the development on skin cancers. NBUVB should be used in chronic AD in particular, with the same protocols as for the treatment of psoriasis.¹⁹ Usually two to three sessions per week are prescribed for a period of 12 weeks.

UV-therapy can also be combined with other treatment modalities, topical and systemic, and is a safe and effective way to manage patients with AD.

EMOLLIENTS

Xerosis (synonym: dryness) is one of the most prominent clinical features of AD. Dryness is a component of the diagnostic criteria of AD.²¹ The underlying mechanisms of dryness in AD are complex and are probably due to specific abnormalities of skin lipids, decreased natural moisturising factor and defects in the aquaporin water channels of the skin¹.

Dryness can lead to inflammation, small cracks and fissures, and impairment of the barrier function of the skin. Dryness also increases the bacterial adherence of *Staphylococcus aureus* to the skin.¹¹

Moisturisers should be used to hydrate the outer layers of the skin. The primary defect in AD is the impaired barrier function of the skin. Emollients thus provide a protective layer on the skin to prevent water loss and the entry of possible harmful substances such as bacteria and irritants.⁸ For this reason, moisturisers remain one of the cornerstones of AD treatment, and the single most important non-pharmacological therapeutic option available. The optimal use of emollients can decrease the number of consultations with physicians as well as the use of expensive medications with possible side effects.⁸ The regular use of emollients, not only improves eczema severity,²² but also the quality of life of patients.²³ Furthermore, emollients relieve the sensation of dryness, soreness and itchiness of the skin. Additionally, emollients reduce flares of AD and can decrease the amount of topical steroids necessary to control the eczema, thus acting as steroid-sparing agents.²⁴ There are also claims that emollients have mild anti-inflammatory activity and may even decrease allergic sensitisation in patients.¹¹ Although most of the advantages of moisturisers are logical and experienced in daily practice, there is a need for robust scientific data to support these diverse effects.

There are numerous different formulations of moisturisers on the market and they are broadly classified as ointments, creams and lotions, depending on their consistency. Ointments are greasier and lotions and creams contain more water and are therefore more cosmetically acceptable. Ointments are superior in protecting the barrier function of the skin, but because they are more occlusive, they may be cosmetically less acceptable and may also cause folliculitis. In general, a more greasy ointment should be used on areas of chronic dermatitis (synonym: lichenified skin) and a cream or lotion should be used on areas of acute, weeping dermatitis. Lotions are preferred in hair-bearing areas.

Patients often enquire which moisturisers are best. There is little difference between the various emollients on the market. Generally, the best moisturiser should be unperfumed and without a colorant. The cosmetic preference of the patient is vital. The treating doctor should always ensure that the patient is satisfied with the consistency of the emollient, in order to ensure compliance. Different formulations can also be used for different anatomical locations. For instance, a cream can be used for the face and an ointment for the body. On the other hand, a single product that can act as both a wash product and a moisturiser may be selected. The patient's preference may also change over time, as their skin and eczema changes, and for this reason, their compliance with emollients should be assessed regularly. Different formulations should be made available to the patient, in order to improve compliance.⁸

Generally, emollients do not have any side-effects, but may occasionally cause stinging, burning or contact dermatitis. Patients experiencing unfavourable symptoms after the application of an emollient should stop using the product.

There are many new types of emollients on the market that claim to provide an added benefit, due to the presence of active components purported to restore the barrier defect in the skin. An excellent review of these products was recently published.²⁵ There are studies supporting a beneficial effect for ceramide-containing creams in AD,²⁶ but the cost:benefit ratio is very high. A randomly controlled trial compared two of the leading "barrier repair creams" with a regular petroleum-based moisturiser and found that the regular product was 47 times more cost-effective.²⁷ The use of these moisturisers are therefore, not routinely advocated.

Aqueous cream should be avoided as a 'leave-on' moisturiser

due to the fact that many formulations contain sodium lauryl sulphate. Sodium lauryl sulphate is a preservative that, in the unbuffered form, can decrease the barrier function of the skin and potentially worsen eczema.²⁸ Aqueous cream can however be used as a soap-substitute when bathing or showering.²⁹

The maximum duration of effect of moisturisers is not more than six hours, but it is often not practical to apply moisturisers more often. It is therefore advised that patients use moisturisers at least twice a day. Patients should preferably use them after bathing or showering and after swimming. Emollients should be used liberally and in large quantities, 250 g to 500 g per week, all over the body. Patients should be advised to use emollients even if there is no active eczema visible. Health care workers should take the time to demonstrate to patients how to apply the moisturisers. Moisturisers should be applied with a smooth motion, in the direction of the body hair growth. Rubbing is discouraged. When moisturisers are used at the same time as other topical products, such as topical steroids for example, they can be used one after the other with several minutes between applications. It does not matter in which order they are applied.⁸ (See Table II for advice on using emollients).

Health care workers should reinforce the importance of emollient use at each follow up visit.

Table II. General advice for the use of emollients in atopic dermatitis.

- Apply a moisturiser at least twice daily, every day – more if possible.
- Choose a non-perfumed and colorant free moisturiser that is cosmetically acceptable – texture that the patient prefers.
- Use a generous amount and apply all over the body.
- Apply moisturiser after bathing/showering.
- Apply the moisturiser in smooth strokes and do not rub in the direction of hair growth.
- Use a moisturiser even if there is no visible eczema.
- Moisturisers can be used under occlusion, if necessary – especially on very dry areas.
- Apply steroid cream after moisturiser.

PSYCHOLOGICAL MEASURES

There is no doubt that AD has a major psychological impact on the patient and their extended family.¹ Stress, anxiety

and emotional factors do influence eczema. The extent to which psychological factors influence cause or effect of AD is not known. The severe itching of AD leads to scratching, which again leads to worsening of the eczema, the so-called itch-scratch-cycle. An integral component of the effective treatment of AD is to break this cycle and the habit of scratching. Two randomised controlled trials provide evidence that behavioural therapies by habit reversal, in combination with topical steroids, were more effective than topical steroids alone.¹¹

Other studies have shown beneficial effects from biofeedback therapies, hypnotherapy and support groups.¹

Unfortunately, the evidence for these modalities and their cost-effectiveness is not clear and will need further exploration.⁸

EDUCATION

Proper education is another cornerstone in the treatment of AD. Compliance and adherence to therapy will increase significantly with effective education.¹ Education of patients with AD will be discussed in detail elsewhere in this journal.

CONCLUSION

AD is an incurable, chronic and relapsing skin disorder with a severe impact on the quality of life of patients, their caregivers and their families. Pharmacological treatments are expensive and have considerable side effects. Non-pharmacological treatment modalities offer a safe and cost-effective way to control the disease and improve quality of life. Modalities such as bathing practices, the use of emollients and patient education form the cornerstones of AD management, and for this reason, their importance cannot be overemphasised.

Further studies to evaluate these modalities are encouraged.

DECLARATION OF CONFLICT OF INTEREST

The author declares no conflicts of interest.

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A green and yellow gecko-like creature with large, webbed feet, clinging to a purple surface. The creature has a long, thin tail and a small head with large eyes. It is positioned vertically, with its head at the bottom and its tail at the top. The background is a solid purple color.



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