

REVIEW ARTICLE

Factors contributing to poor treatment outcomes in childhood atopic dermatitis

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ABSTRACT

Atopic dermatitis (AD) is a chronic relapsing inflammatory disease of the skin and is the most common paediatric dermatological condition. While no cure is available, it can be treated effectively if adherence to a therapeutic plan is maintained. Poor adherence to treatment is common in AD and can lead to treatment failure, which has significant impacts on the patient, family and society. A comprehensive literature search was conducted to identify factors that contribute to poor treatment adherence in childhood AD and to identify possible strategies to remedy these. Identified factors leading to poor treatment adherence include: complexity of treatment regimen, lack of knowledge, impaired quality of life, dissatisfaction with treatment strategies, infrequent follow up, corticosteroid phobia and the use of complementary and alternative medicine. Effective strategies to increase treatment adherence include: caregiver education and utilisation of education adjuncts, optimisation of the patient/caregiver–clinician relationship, early and frequent follow up and improvement of patient and caregiver quality of life.

Key words: adherence, atopic dermatitis, compliance, eczema, management, treatment.

INTRODUCTION

Atopic dermatitis (AD) is a common inflammatory disease of the skin with a chronic relapsing course.^{1,2} Treatment regi-

mens are often complex, consisting of the daily application of emollients and long-term topical corticosteroid (TCS) or the use of calcineurin inhibitors. Further strategies include environmental modification, avoidance of triggers, phototherapy and the management of complications such as secondary infections. Oral anti-inflammatory medications and immunomodulators may be required in severe cases. The available treatment strategies are effective.^{3,4} However, poor treatment adherence is common, and only 32% of patients have been found to be adherent to topical therapy in AD when measured with electronic monitoring,⁵ leading to poor treatment outcomes. This highlights the fact that non-adherence to treatment is an important cause of treatment failure.⁵

Implications of poor treatment adherence in AD

Poor treatment outcomes have significant consequences for patients and their families.⁶ Children with AD suffer from sleep disturbance, are more irritable, require greater attention^{7–9} and are at increased risk of mental health problems by the age of ten.¹⁰ This has substantial psychosocial implications for their caregivers and families.¹¹ The ability of parents to work, complete household duties and engage in social activities is impaired^{6,12–14} and parents also experience significant psychological strain from self-blame, guilt and sadness.⁷ The personal economic burden of AD is also significant; with one Australian study quantifying the direct mean costs to families of AU\$330, AU\$818 and AU\$1255 annually for mild, moderate and severe AD, respectively, with further indirect costs including the loss of income from time taken off work, travel and the cessation of employment.¹⁴ In addition, the economic burden to society is considerable, with significant costs resulting from primary care and emergency department presentations, hospital

Abbreviations:

AD	atopic dermatitis
CAM	complementary and alternative medicine
CS	corticosteroid
HRQoL	health-related quality of life
TCS	topical corticosteroid
TPE	therapeutic patient education

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Table 1 Levels of evidence and associated grade of recommendation. Modified from the Oxford Centre for Evidence-based Medicine Levels of Evidence²²

Grade of recommendation	Level of evidence	Description
A	1a	Systematic review of RCT
	1b	Individual RCT with narrow confidence interval
	1c	All or none
B	2a	Systematic review of cohort studies
	2b	Individual cohort study (including low quality RCT, e.g., < 80% follow up)
	3a	Systematic review of case-control studies
C	3b	Individual case-control study
	4	Case series and poor quality cohort and case-control studies
D	5	Expert opinion without explicit critical appraisal, or based on physiology, bench research or first principles

RCT, randomised controlled trial.

admissions, speciality consultations, prescription medications, procedures and laboratory costs,¹⁵ with estimates of direct financial costs in the USA of between US\$364 million to US\$3.8 billion annually.^{15–17} Treatment may be escalated inappropriately if poor treatment outcomes are interpreted as ineffectiveness of the treatment rather than poor adherence to treatment,¹⁸ which may result in significant systemic side-effects for the individual,¹ additional psychosocial burden on families and further financial costs to society.

Limitations of assessing treatment adherence

It is difficult to gauge treatment adherence in the clinical setting. Self-reports by patients and caregivers may overestimate treatment adherence, though diary and questionnaire measures may be more accurate than interview-based self-reports.¹⁹ Non-self-report measures include pill counts, canister weights, pharmacy claims and electronic monitoring. However, all these measures reflect presumed adherence rather than providing an absolute measure of medication applied or ingested.²⁰ Despite these difficulties, findings from studies of treatment adherence suggest that non-adherence is extremely common in patients with chronic disease²¹ and this has significant implications for treatment outcomes.

Objectives

The purpose of this review article is to identify the major causes of poor treatment adherence in childhood AD and to suggest mitigating strategies to improve adherence.

METHODS

A comprehensive literature search was conducted using PubMed/MEDLINE, Embase, the Cochrane Database of Systematic Reviews and the Cochrane Central Register of Controlled Trials in October and November 2013. The following search terms were used: ‘atopic dermatitis’ or ‘atopic eczema’ or ‘eczema’ and ‘adherence’ or ‘compliance’. Published studies up to November 2013 were included. The search was limited to English language studies. The highest level of evidence and grade of recommendation was noted

for each suggested mitigating strategy, using a modified version of the Oxford Centre for Evidence-based Medicine levels of evidence table (Table 1).²²

RESULTS

Factors contributing to poor treatment outcomes

Complexity of treatment regimens

Treatment regimens are perceived to be complex and burdensome as a result of the prescription of multiple medications, frequent dosing schedules and the cumbersome application of topical preparations.²⁵ The requirement for long-term therapy is also often problematic. Adherence to even a twice-daily application of topical therapy drops by 60% a few days after the commencement of treatment.⁵ Parents and caregivers admit that taking shortcuts, such as the reduced frequency of topical therapy application, is necessary to simplify treatment regimens.²⁵

Lack of knowledge

Lack of understanding of the disease pathogenesis and prescribed treatments is common in AD.^{24,25} Nearly half the parents and caregivers, when questioned, cannot correctly identify the potency of commonly prescribed TCS or the nature of the antimicrobial components correctly.²⁵ Such lack of understanding may result in the incorrect application of topical therapy and confusion about the escalation of treatment, leading to poor treatment adherence and outcomes.

Impaired quality of life

To be successful, complex treatment regimens in the context of chronic disease require ongoing commitment from patients and caregivers. Emollients are applied even when there is no evidence of active disease on the skin, giving little respite from caregiver duties. Health-related quality of life (HRQoL) is significantly impaired in children with AD and their caregivers,⁶ which has direct negative implications for treatment adherence.^{26,27}

Patient dissatisfaction

Patient satisfaction is a determinant of treatment adherence.^{28,29} A cross-sectional survey in Japan reported that a satisfactory patient/caregiver–clinician relationship was the most important factor driving treatment adherence in their population.⁵⁰ However, a survey of the UK National Eczema Society showed that only 19% of initial consultations with a dermatologist met patients' expectations and only 40% of patients were satisfied with the treatment given.¹² Acknowledging patients' preference is an important component of patient satisfaction. Recommendations for topical therapies should take patient/caregiver vehicle preference into account,⁵¹ including the type of preparation⁵² and the frequency of application.²⁵ Treatment plans designed without the patient/caregiver preferences in mind are likely to lead to treatment failure.²⁴

Frequency of follow up

Adherence to topical therapy in AD increases significantly around the time of follow-up appointments.⁵ This finding, termed 'white coat compliance',⁵⁵ has also been reported in psoriasis⁵⁴ and hand dermatitis.⁵⁵ The timing of follow-up appointments also seems to be important, with earlier follow up resulting in higher rates of treatment adherence.⁵⁶

Corticosteroid phobia

Corticosteroid (CS) phobia is a common phenomenon in parents caring for children with AD,^{37,58} with over 80% fearing potential local and systemic side effects associated with regular CS application.⁵⁹ Fears include irreversible skin atrophy, immune suppression and growth failure with long-term steroid application,^{37,40} frequently resulting in treatment failure due to non-adherence.³⁹

Use of complementary and alternative medicine

Despite the lack of evidence for complementary and alternative medicine (CAM) in the management of AD,⁴¹ CAM continues to be a popular adjunct to treatment. Common strategies include homeopathy, the use of botanical extracts and Chinese herbal medicine.⁴¹ More than half of AD patients may include a form of CAM in their management.⁴² CAM is more likely to be used, usually upon recommendation by friends or family, by patients with a long duration of disease and if they perceived that orthodox treatment strategies have failed.⁴² Side-effects, medication interactions and the worsening of AD symptoms with the use of some CAM have been reported,^{45–46} confounding treatment outcomes.⁴⁷ Further, the inappropriate sole use of CAM to manage AD can have catastrophic consequences.⁴⁶

Improving treatment adherence

Optimisation of the patient/caregiver–clinician relationship

A satisfactory relationship between the physician and patient/caregiver is one that involves good verbal and non-

verbal communication, effective listening and collaborative decision-making.⁴⁸ Physicians who appear to show a genuine interest in their patients, who are able to foster understanding and enquire about psychosocial issues are likely to achieve greater patient satisfaction.^{49,50} As clinicians we can embrace our role of health educator to provide disease and treatment specific information to meet the parents' needs and simplify the complexity of treatment to aid their understanding. The use of topical combination formulations has been shown to increase treatment adherence and improve clinical outcomes in acne management.⁵¹

Grade of recommendation: B (level 2b evidence)

Patient education Patient education is a key strategy to improving treatment adherence, as the lack of understanding of the prescribed treatment and fear of medication side-effects are significant adherence confounders in the management of AD. Educational approaches range from the medical practitioner giving simple information and advice to offering comprehensive multidisciplinary strategies. Systematic reviews examining the utility of patient education in AD have been difficult to interpret due to the diversity of educational approaches used, small sample sizes and variability in treatment end-points.^{41,52,55} However, the quality of education is important as longer, more structured sessions improve patient satisfaction⁵⁴ and disease outcomes.⁵⁵ Accordingly, the addition of nurse-led education sessions to standard dermatological consultations has been shown to result in improved patient satisfaction, quality of life and disease outcomes,^{56,57} although large-scale prospective studies are lacking.

Given the proposed benefit of comprehensive education in AD management, guidelines for therapeutic patient education (TPE) have recently been developed,⁵⁸ which will allow for the standardised delivery of a multidisciplinary educational strategy in AD. TPE aims to empower patients with the relevant skills and knowledge required to manage their chronic disease while maintaining their quality of life.⁵⁸ It is a multimodal, patient-centred approach, combining structured teaching with skill transference and psychosocial support and requires input from a number of health professionals, including doctors, nurses and clinical psychologists. It comprises a thorough initial consultation with a doctor and nurse team and the identification of educational objectives to allow targeted delivery of information using a variety of educational resources. Collective teaching sessions can also be incorporated into the model using either lecture or workshop formats. Standardisation of the educational model will allow for a more rigorous investigation into its usefulness in improving treatment adherence in AD.

Grade of recommendation: A (level 1b evidence)

Written eczema action plans Written action plans have been proposed as useful educational adjuncts to verbal instruction in AD.⁵⁹ Two studies, including a small randomised controlled trial⁶⁰ and a quality improvement

study,⁶¹ have shown beneficial outcomes following the addition of eczema action plans to simple verbal instruction during patient consultations. Benefits included increased patient understanding as well as decreased anxiety about self-management in AD, which may increase patient satisfaction, improve their quality of life and result in better treatment adherence.

Grade of recommendation: B (level 2b evidence)

Other education adjuncts Additional education adjuncts have been suggested to promote treatment adherence but have not been rigorously studied. The accuracy of topical agent application by adults with AD was improved when fluorescent cream was used as a teaching aid⁶² and the regularity of topical agent application may be increased with positive reinforcement strategies in children, such as sticker charts⁶³ and with memory aids such as regular text messages in adolescents.⁶⁴

Grade of recommendation: C (level 4 evidence)

Targeted education regarding TCS Educating caregivers about the important role of TCS in AD management is critical at the time of treatment prescription to overcome the potential impact of CS phobia. Side-effects from TCS are extremely rare and are usually secondary to an inappropriate prescription of highly potent formulations or incorrect application of the TCS.^{65–67} Correctly applied TCS are well tolerated, even with prolonged use,⁶⁸ with most side-effects being reversible if they are diagnosed early.⁶⁹ Counselling patients and parents about the role of TCS in AD treatment, as well the method of application, leads to decreased parental anxiety and a higher acceptance of CS treatment.⁷⁰

Grade of recommendation: B (level 2b evidence)

Early and frequent follow up Regular follow up may reduce the perceived burden of treatment, maintain patients' motivation and convey the physician's interest in patient adherence.⁴⁸ More frequent follow ups may facilitate treatment adherence.⁵¹ Further, as treatment adherence declines rapidly following the initial consultation, earlier follow ups may lead to increased adherence,⁵⁶ although a small randomised controlled trial was unable to confirm this.⁷¹

Grade of recommendation: B (level 2b evidence)

Improving quality of life A number of studies have underlined the importance of maintaining quality of life of both patients and caregivers in AD management as impaired HRQoL has negative implications for the use of topical therapy.²⁸ The number and severity of AD flares are directly correlated with reduced HRQoL,¹¹ suggesting that strategies that aim to improve disease outcomes through better treatment adherence should lead to an improvement in the patients' quality of life. Better disease control may then serve as positive reinforcement for ongoing treatment

adherence and may potentially reduce caregiver's willingness to try adjunct strategies such as CAM due to perceived futility of orthodox treatments.

Grade of recommendation: D (level 5 evidence)

Future research Poor treatment adherence is common in childhood AD, with significant implications for the individuals concerned, their family and society. While a number of prospective trials have been conducted to investigate strategies that are effective in improving treatment adherence, more research is needed. Educational interventions can now be studied more rigorously with the publication of standardised guidelines for TPE in AD. While the regularity of follow up is important, further research into the exact frequency and mode of follow up is warranted. The caregiver burden may be improved and the perceived complexity of treatment strategies can be rendered less daunting with the development of new vehicles that reflect patient/caregiver preferences. It is also essential to define the sources and impact of misinformation on the use and safety of TCS to better support the patient/caregiver and improve treatment adherence.

CONCLUSION

Identifying the major factors that lead to poor treatment adherence is of particular importance in childhood AD, where a common cause of treatment failure is poor adherence rather than disease severity or the ineffectiveness of treatment. A prescribed treatment plan can lead to significant improvements in disease and psychosocial outcomes. However, poor adherence is very prevalent for a variety of reasons. Building a strong patient/caregiver–clinician relationship, simplifying treatment regimens, implementing comprehensive education sessions and increasing the frequency of follow up are important mitigating strategies against poor treatment adherence in childhood AD. Future research will better define the most effective ways of implementing these strategies in the clinical setting, improving both disease outcomes and the quality of life of patients and caregivers.

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