ORIGINAL RESEARCH

Efficacy of Mometasone Furoate Cream Sodium Alginate Skin Repair Mask in Atopic Dermatitis Treatment

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ABSTRACT

Objective • To observe the clinical effect of mometasone furoate cream sodium Alginate Skin Repair Mask in the treatment of atopic dermatitis (AD). By assessing the combined use of these two treatments, the study aims to address a gap in knowledge regarding the effectiveness and safety of adjuvant therapies for AD, particularly in the context of Alginate Skin Repair Mask.

Methods • Eighty patients were enrolled, including 42 males and 38 females aged 20-47 years, with an average age of (32.52±5.57) years, from July 2021 to July 2022, and the patients were divided into a single group (n=40) and a combined group (n=40) by random number table method. The patients in the single group were treated with mometasone furoate cream alone, and the patients in the combination group were treated with Alginate Skin Repair Mask on the basis of the treatment of the patients in the single group. The outcome measurements included clinical treatment effect, condition change (SCORAD score), quality of life (DLQI score), adverse reactions and disease recurrence were compared between the two groups. Both groups received treatment for 1 month. After the treatment of the patients, they were followed up for a period of 3 months.

Results • The total effective rate of the single group was 80.0% (32/40), and that of the combined group was 97.5% (39/40) ($P < .05$). After treatment, the skin lesion area score, skin lesion degree score, pruritus insomnia score, and SCORAD total score in the combined group were significantly lower than those in the single group (35.03±9.41 vs 44.03±12.04) (all $P < .05$). The DLQI score of the combined group after treatment was significantly lower than that of the single group (3.72±1.53 vs 6.98±2.16) ($P < .05$). The incidence of adverse reactions in the single group was 22.5% (9/40), and the disease recurrence rate was 32.5% (13/40), while the incidence of adverse reactions in the combination group was 2.5% (1/40). The disease recurrence rate was 7.5% (3/40), and the incidence of adverse reactions and disease recurrence rate in the combination group were significantly lower than those in the single group (7.314, 7.812).

Conclusion • Mometasone furoate cream sodium Alginate Skin Repair Mask has an ideal clinical effect in the treatment of atopic dermatitis. Compared with single mometasone furoate cream, the combination of sodium Alginate Skin Repair Mask can further improve the patient's condition, improve the quality of life of the patient, and reduce the risk of adverse reactions and disease recurrence. The higher total effective rate in the combined group indicates that the addition of Alginate Skin Repair Mask to the treatment regimen resulted in improved outcomes for patients with atopic dermatitis (AD). This translates to better control of the disease, reduction in symptoms, and overall improvement in the patient's condition. However, it is important for clinicians to be aware that the use of topical glucocorticoids like mometasone furoate cream can potentially lead to adverse reactions. Some documented adverse reactions associated with long-term use of topical glucocorticoids include acne-like eruption, telangiectasia (dilation of small blood vessels), and local skin atrophy.

By addressing multiple aspects of AD management, including skin barrier repair, moisturization, and inflammation control, the combination of mometasone furoate cream and Alginate Skin Repair Mask provides a more comprehensive treatment approach. This comprehensive approach may contribute to the observed reduction in recurrence rate in the combination group compared to the single group, where only mometasone furoate cream was used. (*Altern Ther Health Med.* [E-pub ahead of print.])

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INTRODUCTION

Atopic dermatitis (AD) is a common clinical chronic inflammatory skin disease,[1] and evidence[2] shows that the incidence of AD disease in China has shown a gradual upward trend in recent years. Beyond the context of China, the incidence of AD has shown an alarming upward trajectory worldwide. One study conducted in multiple cities in China found that the prevalence of atopic dermatitis in children ranged from 8% to 20% across different cities.[1] Another epidemiological survey conducted in various regions of China reported a prevalence range of 2% to 10% for adult atopic dermatitis[1] The global burden of AD is substantial, with estimates suggesting that up to 20% of children and 3% of adults are affected by this condition.[2] Infants and young children are a frequent group of AD diseases, and the clinical manifestations of the disease are mainly dry skin, severe itching, eczema-like rash, etc.. Because the disease has the characteristics of repeated attacks, a long course of disease, and protracted healing, this leads to. In some children the disease persists into adulthood. At present, the clinical etiology and pathogenesis of AD have not been fully clarified, and some

studies[3] believe that it may be related to factors such as genetic susceptibility, allergic stimuli, and autoimmune system. Certain variations in genes related to the skin barrier function, immune system regulation, and inflammatory responses can increase an individual's susceptibility to AD. These genetic variations can lead to impaired skin barrier function, making the skin more vulnerable to allergens, irritants, and microbial invasion. Allergic stimuli, such as allergens or environmental triggers, can provoke an immune response in individuals with AD. When exposed to allergens like dust mites, pollen, certain foods, or animal dander, the immune system of susceptible individuals may overreact, leading to an exaggerated inflammatory response. This immune response causes itching, redness, and the characteristic eczema-like rash seen in AD. In individuals with AD, there is evidence of immune system dysregulation, specifically a skewed T helper cell response. There is an increased production of Th2 cytokines (such as interleukin-4 and interleukin-13) and a decreased production of regulatory cytokines (such as interleukin-10). This imbalance leads to an exaggerated inflammatory response and a compromised ability to control allergic reactions and inflammation in the skin. These factors, in combination with environmental triggers, can disrupt the skin barrier, trigger immune responses, and result in the characteristic symptoms of atopic dermatitis. The occurrence of AD disease will have a serious impact on the quality of life, physical and mental health, and skin beauty of patients. Therefore, finding an efficient and safe treatment plan is of great significance for improving patients' condition and quality of life.[4]

Treating atopic dermatitis (AD) poses several challenges. 1) AD is known for its chronic and relapsing course, with periods of flare-ups and remissions. Even with effective treatment, many patients experience recurrent episodes of symptoms. The exact triggers for these flare-ups can vary among individuals, making it difficult to predict and prevent them consistently. Managing the recurrent nature of AD requires a comprehensive approach that focuses not only on acute symptom control but also on long-term maintenance and prevention strategies. 2) Topical glucocorticoids, commonly prescribed for AD, are effective in reducing inflammation and controlling symptoms. However, their long-term use can lead to adverse effects, especially when used in higher potencies or over large areas of the body. These adverse effects may include skin thinning, discoloration, increased susceptibility to infections, and potential systemic absorption with the risk of systemic side effects. Balancing the need for symptom control with the risk of adverse effects is a crucial consideration in the treatment of AD.[7] 3) AD is a highly heterogeneous condition, and treatment responses can vary significantly among individuals. What works well for one patient may not be as effective for another. Finding the optimal treatment regimen often involves a trial-and-error approach, which can be time-consuming and frustrating for both patients and healthcare providers. Personalized treatment plans that consider the specific characteristics and needs of each patient are essential but can be challenging to develop. 4) AD not only affects the physical well-being of individuals but also has a substantial impact on their quality of life. Chronic itch, sleep disturbances, and visible skin lesions can lead to psychological distress, social stigma, and reduced productivity. Addressing the psychosocial aspects and overall well-being of patients with AD is an important part of comprehensive management but can be challenging to achieve. Mometasone furoate cream is a topical glucocorticoid drug,[5] which is one of the most commonly used drugs in the clinical treatment of AD patients, and its application can quickly relieve symptoms and signs of patients in a short period of time. Mometasone furoate cream belongs to the class of corticosteroids and exhibits potent anti-inflammatory properties. It works by inhibiting the release of inflammatory mediators and suppressing the immune response in the skin. By reducing inflammation, mometasone furoate cream helps alleviate the redness, itching, and swelling associated with AD.[6] One of the primary goals of AD treatment is to relieve symptoms and improve the patient's quality of life. Mometasone furoate cream is effective in providing symptomatic relief by reducing itching, erythema (redness), and other signs of inflammation. It helps to calm the skin, alleviate discomfort, and promote the healing of eczematous lesions.

Related studies[8] have shown that topical glucocorticoid drugs combined with adjuvant repair dressings can further improve patients' skin symptoms, repair the damaged skin barrier of patients, and help patients reduce the risk of subsequent disease recurrence. Adjuvant therapies aims to enhance their effectiveness and provide added benefits. It is expected to complement the effects of mometasone furoate cream, such as skin barrier repair, moisturization and hydration, enhanced absorption and drug retention, and protection and comfort.

Sodium Alginate Skin Repair Mask is a commonly used adjuvant therapeutic emollient in our hospital.[4] It has the functions of reducing skin irritation, moisturizing, and protecting the stratum corneum of patients. The dressing aids in repairing the damaged skin barrier and offers additional benefits such as reducing skin irritation, moisturizing the skin, and protecting the stratum corneum. The specific composition of Alginate Skin Repair Mask includes sodium alginate, sodium acid, trehalose, glycerin, glyceryl monostearate, and cetostearyl alcohol. It exerts its therapeutic effects through several mechanisms: 1) Moisture retention: Sodium alginate in the dressing forms a gel-like matrix that absorbs wound exudate and maintains a moist environment. This moisture retention promotes wound healing by facilitating cellular migration, reducing scab formation, and optimizing the wound-healing process. 2) skin protection: The dressing acts as a barrier, protecting the skin from external irritants and preventing further damage. It helps to shield the skin from friction, allergens, and microbial contamination, reducing the risk of infection and inflammation. 3) Skin hydration: The presence of glycerin and other moisturizing agents in the dressing helps to

hydrate the skin, preventing dryness and promoting skin barrier repair. Hydrated skin is less prone to itching and irritation, providing relief to patients with atopic dermatitis. 4) Compatibility with topical medication: The dressing is designed to be used in conjunction with mometasone furoate cream. It is compatible with the cream and does not interfere with its effectiveness. Instead, the dressing complements the cream by providing additional benefits to the skin via the following routes: 1) Sodium alginate dressings have excellent moisture-retaining properties. When applied to the affected skin, these dressings create a moist environment, which helps to hydrate the skin and prevent excessive water loss. Adequate hydration is crucial for maintaining skin barrier function, reducing dryness, and promoting the healing process in AD. 2) Sodium alginate dressings have high absorbency, making them effective in managing exudative or weeping lesions commonly seen in AD. The dressings can absorb excess fluid and exudate from the skin, keeping the affected area clean and reducing the risk of maceration. This absorption property helps maintain a favorable wound environment, promoting healing and reducing the risk of infection. 3) Sodium alginate dressings form a protective barrier over the affected skin. This barrier provides physical protection against external irritants, allergens, and microorganisms. It helps to reduce friction and trauma to the skin, preventing further damage and allowing the skin to heal. The barrier function of sodium alginate dressings also aids in reducing itching and discomfort. 4) Sodium alginate dressings have the ability to exchange sodium ions in the dressing with calcium ions present in the wound fluid. This ion exchange process results in the formation of a gel-like matrix when the dressing comes into contact with wound exudate. The gel-like matrix helps to maintain a moist wound environment, supports cellular migration and tissue regeneration, and facilitates the healing process. 5) Sodium alginate dressings possess hemostatic properties, meaning they can help control bleeding from superficial wounds or raw areas associated with AD. The dressings can interact with the blood components, forming a gel-like clot that promotes hemostasis and reduces the risk of further bleeding. The study is the lack of sufficient research reports on the adjuvant treatment of AD with repairing dressings, particularly in China. This gap in knowledge highlights the need for further investigation to evaluate the clinical effects of adjuvant therapies, such as Alginate Skin Repair Masks, in the management of AD. Alginate Skin Repair MaskTo this end, the objective of this study is to assess the clinical effect of Alginate Skin Repair Mask as an adjuvant therapy in the treatment of atopic dermatitis. Specifically, the study aims to evaluate the impact of sodium Alginate Skin Repair Mask on symptom relief, skin barrier repair, moisture retention, inflammation reduction, and overall improvement in AD severity. This research will provide valuable evidence regarding the effectiveness and potential benefits of sodium Alginate Skin Repair Mask as an adjuvant therapy in the management of AD, addressing the research gap and contributing to the knowledge base in this field.

PATIENTS AND METHODS

Participants

A total of 80 AD patients admitted to our hospital from July 2021 to July 2022 were selected as the research objects. Basic information such as sex, age, course of disease, and severity of all patients was collected, and the patients were divided into single groups by random number table method. group (n=40) and combined group (n=40). This research complies with the requirements of the Declaration of Helsinki and has been approved by our hospital's Ethics Committee. All research subjects are informed about this research and have signed relevant consent forms.

A randomization table, was used to assign participants to different treatment groups. This method ensured that each participant had an equal chance of being assigned to any of the treatment groups, minimizing selection bias and creating comparable groups. The allocation was done in a blinded manner, where neither the participants nor the researchers were aware of the assigned treatment group to minimize bias.

Inclusion and Exclusion Criteria

Inclusion criteria: 1) All patients were diagnosed with AD by relevant clinical tests (The diagnosis of AD included the presence of characteristic symptoms such as chronic or recurrent pruritus, dry and inflamed skin, erythematous patches, vesicles, crusting, excoriation, and the impact of itching on daily life. Additionally, the diagnosis required the presence of specific skin lesions, including dryness, roughness, cracking, erythematous plaques, papules, crusting, eczematous fissures, or ulcers. The age-related onset of AD, typically in infancy but also occurring in children, adolescents, and adults, was considered. Other potential causes of similar symptoms and skin lesions, such as contact dermatitis, fungal infections, or psoriasis, were excluded.); 2) All patients were adults and aged <50 years; 3) The symptoms of skin lesions lasted for at least 1 week; 4) The patients had not used the drug recently (30 days) Glucocorticoids, antihistamines and other treatments; 5) All patients are willing to cooperate with the follow-up investigation of this study; 6) All patients are in good mental condition, with normal cognitive function, and can correctly complete the various tasks proposed in the study.

Exclusion criteria: 1) Exclude patients with severe organ diseases; 2) Exclude patients with blood system, immune function and other diseases; 3) Exclude patients with mental diseases or cognitive and behavioral dysfunction; 4) Exclude patients with severe infectious diseases 5) Exclude those with other skin diseases; 6) Exclude those with allergies or related contraindications to the drugs and methods used in this study; 7) Exclude those with incomplete clinical data; Patients and their families who cooperated with this study. These exclusion criteria were chosen to ensure the validity and generalizability of the study findings, maintain participant safety, and minimize confounding factors that could impact the evaluation of the specific treatment under investigation.

Mild: Limited skin involvement with mild erythema, minimal or no edema, and minimal itching. Moderate: Moderate skin involvement with moderate erythema, edema, and itching. Severe: Extensive skin involvement with severe erythema, significant edema, and intense itching.

Methods

Both groups received treatment for 1 month. After the treatment of the patients, they were followed up for a period of 3 months by telephone, WeChat, recall, etc. During this period, the occurrence of adverse reactions and disease recurrence were mainly recorded.

(1) A single group of patients was treated with a single mometasone furoate cream. The specific method is as follows: After thoroughly cleansing the affected skin of the patient, take a suitable quantity of mometasone furoate cream (Bayer Pharmaceuticals (Shanghai) Co., Ltd., H19991418) and apply it evenly onto the patient's affected area. The frequency of medication should be adjusted based on the severity of the patient's condition, with a maximum of three applications per day; the concentration of mometasone furoate in the cream used was 0.1%.

(2) Patients in the combination group were treated with Alginate Skin Repair Mask (Xi'an Denovo Hith Medical Technology Co., Ltd., Medical device registration certificate number: Shaanxi Medical Approval 20212140109) on the basis of the treatment of the single group of patients. The method, dose, and frequency of using mometasone furoate cream in the combined group were consistent with those in the single group. The application method for Alginate Skin Repair Mask was as follows: After waiting for 30 minutes, open the outer packaging of the dressing, and squeeze out an appropriate amount of the product and apply it evenly directly onto the patient's affected skin. The frequency of application of the dressing depends on the frequency of use of mometasone furoate cream.

Observational indices

(1) Clinical treatment efficacy: evaluated according to the decline rate of SCORAD score before and after treatment. Cured: the clinical symptoms of the patient disappeared, and the score decrease rate was ≥90%; markedly effective: the patient's symptoms basically disappeared, and the score decrease rate was 60%-90%; effective: the patient's symptoms improved, and the score decrease rate was 20%-60%; ineffective: The patient's signs and symptoms were not significantly improved or even aggravated, and the score decrease rate was less than 20%.

To calculate the SCORAD (SCORing Atopic Dermatitis) index,[7] a commonly used method to assess the severity of atopic dermatitis, follow these general steps:

1. Assess the severity of skin lesions: Divide the affected areas of the patient's body into head, trunk, limbs, and hands/feet. Evaluate parameters such as erythema, papulation, exudation, skin thickness, and excoriation, assigning scores ranging from 0 to 3 for each area. Calculate the sum of the scores for skin lesions in each area.
2. Evaluate itchiness and sleep quality: Use a Visual Analog Scale (VAS) ranging from 0 to 10 to assess itchiness and sleep quality. Have the patient self-rate and record the scores for both parameters.
3. Patient self-assessment: Using a VAS ranging from 0 to 10, have the patient self-assess the overall severity of the disease.
4. Calculate the SCORAD index: Use the following formula to calculate the SCORAD index: SCORAD index = 0.5 × (sum of scores for head lesions + sum of scores for trunk lesions + sum of scores for limb lesions + sum of scores for hand/foot lesions) + 0.2 × itchiness score + 0.1 × sleep quality score + 0.7 × self-assessment score

(3) Quality of life: it was assessed using the Dermatology Life Quality Index (DLQI) scale. This scale consists of 10 questions, and each question is scored on a scale of 0 to 3 points. The total score of the DLQI scale is 30 points, with higher scores indicating a poorer quality of life. The DLQI scale was administered both before and after treatment to evaluate any changes in the patients' quality of life. Higher scores indicate a poorer quality of life.

(4) Adverse reactions and disease recurrence: Observe the occurrence of adverse reactions in patients during treatment and within one month of follow-up after discharge. Adverse reactions included in this study include drowsiness, folliculitis, itching, skin redness, burning Burning, tingling, etc. During the 3-month follow-up, the disease recurrence of the two groups of patients was observed and compared.

Randomization

1. Generation of random numbers:
   - Random numbers were generated using a computerized random number generator.
   - An independent statistician carried out this process.
2. Allocation concealment (Blinding): The allocation was done in a blinded manner, where neither the participants nor the researchers were aware of the assigned treatment group to minimize bias.
   - The randomization process was conducted with allocation concealment to maintain the blinding of the study, and the outcome assessor was kept blind to the allocation sequence.
3. Implementation of randomization:
   - The allocation sequence was implemented using a central randomization system.
   - Investigators were responsible for implementing the randomization process, ensuring proper assignment.

Statistical analysis

SPSS 26.0 (IBM Corp., Armonk, NY, USA) was utilized for data analysis. The descriptive statistics were used to summarize participant characteristics at baseline. The data for continuous variables were presented as mean ($\bar{x}$ ±

standard deviation (s), and the *t* test was employed for comparisons. The categorical data were expressed as n (%) and compared using the chi-square (χ^2) test. A $P < .05$ was considered statistically significant, indicating a significant difference between the compared groups. For data visualization, GraphPad Prism 8 (GraphPad Software, Inc., San Diego, CA, USA) was chosen as the software for generating graphics.

RESULTS

Baseline characteristics

Eighty patients were enrolled, including 42 males and 38 females aged 20-47 years, with an average age of (32.52±5.57) years. In a single group of 40 patients, there were 22 males and 18 females aged 19-47 years, with an average age of (32.72±5.47) years; the duration of the disease was 4-32 months, with an average duration of (17.49±5.76) months; severity: mild 4 cases, 27 cases of moderate, 9 cases of severe. Among the 40 patients in the combined group, there were 20 males and 20 females; the age was 18-48 years old, with an average age of (33.04±5.36) years; the duration of the disease was 3-35 months, with an average duration of (17.73±5.81) months; severity: mild 4 cases, 26 cases of moderate, 10 cases of severe. The baseline data of the two patient groups were comparable, and there were no significant differences ($P > .05$), as shown in Table 1.

Table 1. Comparison of basic data

	Single group (n=40)	Combined group (n=40)	t/χ^2	*P* value
gender			0.2	.654
male	22	20		
Female	18	20		
age	32.72±5.47	33.04±5.36	0.264	.792
Disease course (month)	17.49±5.76	17.73±5.81	0.186	.853
severity			0.071	.789
mild	4	4		
Moderate	27	26		
severe	9	10		

Comparison of treatment effectiveness

There were 7 cases of cured, 12 cases of markedly effective, 13 cases of effective and 8 cases of ineffective in the single group, while the corresponding figures in the combined group were 11, 16, 12, and 1. The total effective rate of the single-group treatment was 80.0% (32/40), while the combination group achieved a significantly higher total effective rate of 97.5% (39/40) ($P < .05$). (Table 2).

Table 2. Comparison of treatment effectiveness

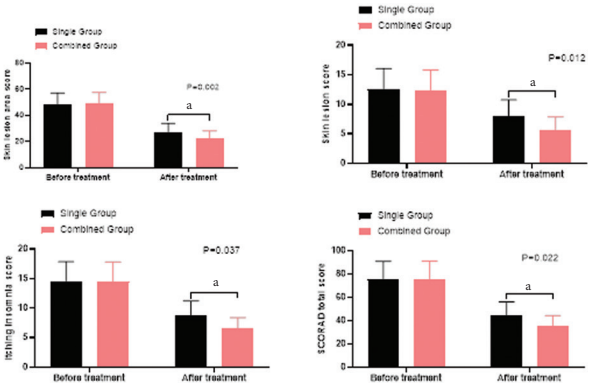
	cured	markedly effective	efficient	ineffective	Total effective rate (%)
Single group (n=40)	7	12	13	8	80.0% (32/40)
Combined group (n=40)	11	16	12	1	97.5% (39/40)
χ^2	-	-	-	-	4.507
P value	-	-	-	-	.033

Comparison of condition changes (SCORAD score)

As depicted in Figure 1, the skin lesion area scores before and after treatment in the single group were (48.45±8.63, 27.32±6.75), the severity of skin lesions scores were (12.59±3.47, 8.03±2.75), itching and insomnia scores were (14.58±3.26, 8.68±2.54), and the total SCORAD scores were (75.62±15.36, 44.03±12.04). In the combined group, the skin lesion area scores before and after treatment were (49.03±8.52, 22.78±5.39), the severity of skin lesions scores were (12.42±3.41, 5.74±2.13), itching and insomnia scores were (14.49±3.32, 6.51±1.89), and the total SCORAD scores were (75.94±15.25, 35.03±9.41).

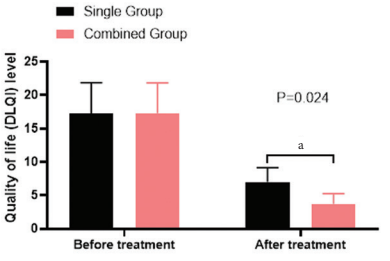
Prior to treatment, there were no significant differences between the two groups in terms of skin lesion area score, the severity of skin lesions score, itching and insomnia score, and total SCORAD score (all $P > .05$). However, after treatment, the combined group exhibited significantly lower scores than the single group in terms of skin lesion area score, the severity of skin lesions score, itching and insomnia score, and total SCORAD score (all $P < .05$).

Figure 1. Comparison of condition changes (SCORAD score)



[a]*P* <.05

Figure 2. Quality of life (DLQI score) comparison



[a]*P* <.05

Quality of life (DLQI score) comparison

As illustrated in Figure 2, the Dermatology Life Quality Index (DLQI) scores of the single group before and after treatment were (17.23±4.62 and 6.98±2.16), whereas the DLQI scores of the combined group before and after treatment were (17.29±4.54, 3.72±1.53).

Prior to treatment, there were no significant differences in DLQI scores between the two groups ($P > .05$). However, after treatment, the DLQI scores of the combined group were significantly lower than those of the single group ($P < .05$), indicating a greater improvement in the quality of life for patients in the combined group.

Table 3. Comparison of adverse reactions and disease recurrence

Adverse reactions	Single group (n=40)	Combined group (n=40)	χ^2	*P* value
drowsiness	1	0	-	-
Folliculitis	1	0	-	-
itching	2	1	-	-
skin redness	2	0	-	-
burn	2	0	-	-
stabbing pain	1	0	-	-
Total incidence (%)	22.5% (9/40)	2.5% (1/40)	7.314	.006
Disease recurrence rate (%)	32.5% (13/40)	7.5% (3/40)	7.812	.005

Comparison of adverse reactions and disease recurrence

The incidence of adverse reactions in the single group was 22.5% (9/40). The disease recurrence rate was 32.5% (13/40), while the incidence of adverse reactions in the combination group was 2.5% (1/40), and the disease recurrence rate was 7.5% (3/40); the incidence of adverse reactions and disease recurrence in the combination group were significantly lower than those in the single group (all $P < .05$) (Table 3).

Note: Drowsiness refers to a state of excessive sleepiness or feeling excessively tired. It manifest as a general sense of fatigue, difficulty staying awake, or a strong desire to sleep. Drowsiness can impact daily activities and is accompanied by reduced alertness or decreased cognitive performance.

Itching, also known as pruritus, is an unpleasant sensation that triggers the desire to scratch the skin. It may vary in intensity and can be localized or widespread. Itching is a common symptom in various dermatological conditions, including atopic dermatitis. Persistent scratching due to itching can lead to skin damage, inflammation, and potentially exacerbate the underlying disease.

DISCUSSION

In recent years, the incidence of AD disease has been gradually increasing, likely due to factors such as the deterioration of living environments and changes in eating habits.[9] AD can affect individuals of all ages and is often accompanied by symptoms such as severe itching, eczema, and rash. The chronic nature and high recurrence rate of the disease have a significant impact on patients' quality of life and overall well-being.[10] Currently, there are several drugs used in the clinical treatment of AD, including glucocorticoids and antihistamines, which can alleviate symptoms to a certain extent.[11] Topical glucocorticoids, such as mometasone furoate cream, are considered the first-line therapy for AD treatment.[12] However, long-term and excessive use of mometasone furoate cream can lead to significant side effects, such as skin atrophy and telangiectasia, and increase the risk of disease relapse after treatment, which can range from 14% to 43%.[13] Studies have suggested that combining topical glucocorticoids with moisturizing emollients can further improve clinical symptoms and accelerate the recovery process of AD patients.[14]

In this study, Alginate Skin Repair Mask was used as an adjunct therapy for AD patients. The dressing, composed of sodium alginate, trehalose, glycerin, glyceryl monostearate, cetostearyl alcohol, purified water, etc., targets the underlying causes of AD, such as skin barrier loss and dysfunction. It also possesses moisturizing, antibacterial, anti-infection, and wound-healing properties, making it an effective adjuvant therapy for AD patients.

The results of the study demonstrated that the combined group had a significantly higher total effective rate (97.5%, 39/40) compared to the single group (80.0%, 32/40) ($P < .05$). Additionally, the combined group showed significantly lower scores in terms of skin lesion area, severity, pruritus, insomnia, and SCORAD total score compared to the single group (all $P < .05$). However, the DLQI score of the combined group was significantly lower than that of the single group after treatment ($P < .05$). These findings are consistent with previous research results[17-20] that stated their life quality was improved using this treatment option, highlighting the effectiveness of the combined therapy approach.

The possible explanations are a) Disease severity: It is possible that the patients in the single group had initially more severe atopic dermatitis compared to the combined group. The higher DLQI scores in the single group after treatment might indicate a greater impact of the disease on their quality of life despite the improvement in clinical outcomes. The higher DLQI scores in the single group after treatment could be attributed to several factors: Treatment response variations: It is possible that the combined treatment approach, involving Alginate Skin Repair Mask and a specific medication, may have resulted in different treatment responses compared to the other groups. The synergistic effect of Alginate Skin Repair Mask was superior to that of monotherapy, which resulted in persistent or worsening symptoms in a subset of single group patients that affected their quality of life and were reflected in higher DLQI scores. Individual variability: Each participant may have had unique factors influencing their response to treatment, such as variations in disease severity, personal characteristics, or overall health status. These individual differences could have contributed to the divergent outcomes observed in the combined group.

Adverse effects: Adverse effects associated with the medicines therapy might have influenced participants' quality of life. For example, side effects from the medication could have contributed to increased discomfort or symptoms, leading to higher DLQI scores. Adjustment period: It is possible that the monotherapy treatment approach required an adjustment period for patients, during which they experienced temporary exacerbations or fluctuations in symptoms before achieving optimal therapeutic effects. This transient period of adjustment could have contributed to the higher DLQI scores in the post-treatment evaluation.

Treatment complexity: The combined treatment involving the use of sodium alginate dressing in addition to mometasone furoate cream may have introduced additional complexities in the treatment regimen. The dressing application process, frequency, or maintenance could impact for the patients, potentially leading to reduced physical or psychological burden. This added complexity might have contributed to the lower DLQI scores in the combined group.

The above results confirm that the combined application of Alginate Skin Repair Mask can further improve the clinical

efficacy of patients, improve the symptoms of patients and improve the quality of life of patients. The reason for this analysis is that the various ingredients in Alginate Skin Repair Mask can effectively increase the water content of the patient's stratum corneum, reduce the level of water loss through the epidermis, and promote the speed and progress of the patient's skin barrier repair. Moreover, Sodium Alginate Skin Repair Mask has a certain barrier protection function, and its combined application can effectively reduce the scratching caused by itching in patients. In addition, the combined application of sodium alginate repairing dressing can also help the patient Establish a continuous wet wrapping state, accelerate the scabbing and softening of the affected area of the patient, so that it is easier to fall off and clean, and further improve the healing of the patient's skin lesion symptoms. Previous studies[21] have shown that AD disease has the characteristics of recurrent attacks and protracted healing, which will not only affect the physical and mental health of patients, but also further increase the burden on patients' families. The safety results of this study showed that the incidence of adverse reactions in the single group was 22.5% (9/40), the disease recurrence rate was 32.5% (13/40), and the incidence of adverse reactions in the combination group was 2.5% (1/40), the disease recurrence rate was 7.5% (3/40), and the incidence of adverse reactions and disease recurrence rate in the combination group were significantly lower than those in the single group (all, $P < .05$). The above results confirmed that Sodium Alginate The combined application of repairing dressings can effectively reduce the risk of adverse reactions and disease recurrence in patients. The possible explanations are 1) promotion of autolytic debridement: Sodium alginate dressings can aid in autolytic debridement, which is the natural process of removing dead or necrotic tissue from the wound. The dressing's ability to create a moist environment enhances the body's own enzymes to break down and remove non-viable tissue, facilitating the healing process. 2) Modulation of inflammatory response: Sodium alginate dressings have been shown to possess anti-inflammatory properties. They can help in reducing local inflammation, which is often associated with adverse reactions and disease recurrence. By modulating the inflammatory response, sodium alginate dressings may contribute to improved wound healing outcomes.

Moreover, the cost-effectiveness of the combined treatment approach can be evaluated based on the following factors: 1) Long-term cost savings: Although the combined treatment may incur higher initial costs, it may lead to long-term cost savings by reducing the risk of disease recurrence or complications. By reducing the frequency of relapses or the need for additional treatments, the combined treatment can lower patients' medical expenses and healthcare resource utilization. These long-term cost savings contribute to the overall cost-effectiveness of the treatment regimen. a) Reduced relapse frequency: The combined treatment approach may help in reducing the frequency of AD relapses. By providing comprehensive and targeted therapy, it can effectively control symptoms and prevent flare-ups. Fewer relapses mean fewer medical appointments, reduced medication needs, and decreased healthcare resource utilization, resulting in cost savings over time.

b) Decreased need for additional treatments: Effective symptom control and disease management through the combined treatment approach can potentially reduce the need for additional treatments, such as rescue medications, topical creams, or systemic therapies. This reduction in treatment requirements directly translates into lower medication costs and fewer healthcare visits, leading to long-term cost savings.

c) Prevention of complications: In some cases, AD can lead to complications that require additional medical interventions and treatments. By effectively managing AD and reducing disease severity, the combined treatment approach can help prevent complications such as secondary skin infections or eczema herpeticum. Avoiding these complications not only improves patient outcomes but also saves costs associated with treating and managing such complications.

Reduced healthcare resource utilization: The combined treatment may decrease patients' demand for healthcare resources. If the combined treatment results in better symptom control and reduces the number of medical visits, it can alleviate the burden on the healthcare system and save healthcare resources. Decreased healthcare resource utilization enhances the overall cost-effectiveness. a) Improved symptom control: By effectively managing AD symptoms, the combined treatment approach can minimize the need for frequent medical visits or emergency department visits. Patients experiencing better symptom control may require fewer consultations with healthcare professionals, resulting in reduced healthcare resource utilization.

b) Decreased hospitalizations: Severe AD flare-ups may sometimes require hospitalization for intensive treatment. With improved symptom control and disease management, the combined treatment approach can potentially reduce the likelihood of hospital admissions related to AD. This reduction in hospitalizations not only lowers healthcare costs but also alleviates the strain on hospital resources, improving overall healthcare system efficiency.

c) Enhanced self-management: The combined treatment approach often involves comprehensive patient education and support to promote self-management. This empowers patients to better understand and manage their condition, reducing their reliance on healthcare resources for routine care. By encouraging self-care and providing patients with the necessary tools and knowledge, the combined treatment approach can contribute to reduced healthcare resource utilization.

However, the combination of mometasone furoate cream and sodium Alginate Skin Repair Mask may potentially cause the following adverse reactions: 1) Skin Irritation and Sensitivity: Both mometasone furoate cream and sodium alginate dressings can individually cause skin irritation,

itching, redness, or a burning sensation. When used together, there is a possibility of increased skin sensitivity or a heightened risk of local skin reactions. 2)Allergic Reactions: Some individuals may be allergic to either mometasone furoate or sodium alginate. Allergic reactions can manifest as skin rash, hives, swelling, or even more severe symptoms such as difficulty breathing or anaphylaxis. If any signs of an allergic reaction occur, immediate medical attention should be sought. 3) Delayed Wound Healing: Mometasone furoate cream, being a corticosteroid, may potentially delay wound healing if applied to open or infected wounds. This can interfere with the effectiveness of the sodium alginate dressing, which is commonly used for wound management.

Clinical Implications

The findings of our study bear significant implications for clinical practice, particularly in guiding treatment decisions for atopic dermatitis (AD) patients. Firstly, the superior efficacy observed in the combined group, where Alginate Skin Repair Mask supplemented with mometasone furoate cream, suggests a potential avenue for enhancing treatment outcomes. Clinicians may consider incorporating sodium alginate dressings as an adjunct therapy for AD cases resistant to conventional treatments or those requiring expedited recovery.

Moreover, the notable reduction in adverse reactions and disease recurrence rates in the combined group underscores the safety and sustained effectiveness of this combined approach. In clinical decision-making, this could encourage a shift towards treatment regimens that not only address immediate symptoms but also mitigate long-term risks and enhance patient compliance.

Furthermore, the improved quality of life, as indicated by the DLQI scores in the combined group, accentuates the holistic benefits of this combination therapy. Integrating such comprehensive care strategies into routine practice may contribute to a more patient-centric approach, fostering improved overall well-being.

In conclusion, our study advocates for the integration of Alginate Skin Repair Mask with mometasone furoate cream, offering clinicians a nuanced and effective approach to managing AD. By balancing efficacy, safety, and quality of life considerations, this combined therapy holds promise for shaping future treatment paradigms in the realm of atopic dermatitis.

Limitations of the study

Single-center design: The study was conducted in a single hospital, limiting the external validity and generalizability of the findings to a broader population. Short follow-up period: The three-month follow-up period may not capture long-term treatment effects and recurrence patterns, potentially understating the durability of the observed benefits. Brand-specific treatment: The study focused on a specific brand and concentration of mometasone furoate cream, potentially restricting the applicability of the findings to other formulations. Limited cultural diversity: As the study was conducted in a specific geographic location (China), cultural and regional factors may limit the generalizability of findings to a more diverse global population.

Some suggestions for future research avenues related to the combined treatment approach for AD should be considered.

1. Long-term effects of the combined treatment: Investigating the long-term effects of the combined treatment approach can provide valuable insights into its durability and sustained benefits. Longitudinal studies that follow patients over an extended period can assess the long-term outcomes in terms of disease control, relapse rates, quality of life, and healthcare resource utilization. Understanding the treatment's long-term efficacy and durability will help healthcare professionals and patients make informed decisions regarding its adoption.
2. Comparative effectiveness studies: Conducting comparative effectiveness studies can compare the combined treatment approach with other available treatment modalities for AD. These studies can evaluate the clinical outcomes, patient-reported outcomes, and cost-effectiveness of the combined treatment approach in comparison to established treatments. Comparative effectiveness research provides valuable information for clinicians, patients, and policymakers to make evidence-based decisions on the most effective and efficient treatment options.
3. Cost-effectiveness analyses: Performing formal cost-effectiveness analyses can assess the economic implications of the combined treatment approach compared to alternative treatment strategies. These analyses should consider both direct medical costs (e.g., medication costs, healthcare visits) and indirect costs (e.g., productivity loss, impact on quality of life). By quantifying the costs and benefits, cost-effectiveness analyses can provide insights into the value of the combined treatment approach and its impact on healthcare resource allocation.
4. Subgroup analyses: Conducting subgroup analyses within the combined treatment group can help identify specific patient characteristics or disease profiles that are more likely to benefit from the treatment. Exploring factors such as age, disease severity, comorbidities, or treatment response patterns can help tailor the combined treatment approach to individual patient needs, leading to more personalized and effective care.
5. Patient-reported outcomes and quality of life assessments: In addition to clinical outcomes, assessing patient-reported outcomes and quality of life measures can provide a comprehensive understanding of the impact of the combined treatment on patients' well-being. Future research can focus on evaluating the treatment's effects on symptoms, functional limitations, psychological well-

being, and overall quality of life. Understanding the holistic impact of the combined treatment approach from the patient's perspective can guide treatment decisions and improve patient-centered care.

6. Real-world evidence studies: Conducting real-world evidence studies can assess the effectiveness and safety of the combined treatment approach in routine clinical practice. These studies can capture data from diverse patient populations and healthcare settings, providing insights into the treatment's real-world performance, adherence rates, and potential barriers or challenges to implementation.

CONCLUSION

In summary, the combination of mometasone furoate cream and Alginate Skin Repair Mask has demonstrated promising clinical outcomes in the treatment of atopic dermatitis. Compared to the use of mometasone furoate cream alone, the addition of Alginate Skin Repair Mask results in further improvement in the patient's condition, enhanced quality of life, and reduced risks of adverse reactions and disease recurrence.

In addition, to mitigate the impact of publication bias, it is essential to consider multiple sources of evidence and not rely solely on published studies. Researchers, clinicians, and policymakers should strive to access all available data, including unpublished studies, conference abstracts, and ongoing clinical trials. In recent years, there have been efforts to promote transparency and access to unpublished data through initiatives like clinical trial registries and data sharing policies.

Additionally, systematic reviews and meta-analyses play a crucial role in synthesizing evidence from multiple studies, both published and unpublished. These comprehensive analyses aim to overcome publication bias by including studies with positive and negative results, thus providing a more balanced and accurate assessment of treatment effects.

Moreover, regulatory agencies and professional organizations often evaluate a broader range of evidence, including unpublished data, when making treatment recommendations or formulating guidelines. This comprehensive approach helps ensure that decisions are based on a more complete understanding of the available evidence.

Awareness of publication bias is crucial, and efforts to address it should be ongoing.

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