

# Curative Effect of 30% Supramolecular Salicylic Acid Combined with Yufa Spray Dressing on Moderate to Severe Scalp Seborrheic Dermatitis

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**Abstract:** *Objective:* To observe the clinical efficacy of 30% supramolecular salicylic acid combined with Yufa spray dressing in the treatment of moderate to severe seborrheic dermatitis (seborrheic dermatitis of the scalp, SDS). *Methods:* From January 2020 to December 2021, 150 patients with SDS, who were treated in the Dermatology Clinic of the First Affiliated Hospital of Xi'an Medical University, were randomly divided into two groups, a treatment group and a control group, with 75 cases in each group. The treatment group was given 30% supramolecular salicylic acid combined with Yufa spray dressing on the basis of external medicine given to the control group, while the control group was given oral medicine combined with external medicine. *Results:* The difference in scores of erythema, scales, pruritus, and folliculitis of the treatment group before and after treatment was significant ( $P < 0.01$ ), indicating that supramolecular salicylic acid combined with Yufa spray dressing can relieve the symptoms of SDS. The difference in scores of erythema of the control group before and after treatment was significant as well ( $P < 0.05$ ), indicating that traditional antibiotics are also effective in treating SDS; however, there was no significant difference ( $P > 0.05$ ) in the scores of other signs and symptoms, such as scales, pruritus, and folliculitis, before and after treatment, indicating that traditional antibiotics have no obvious curative effect on SDS. After 12 weeks of treatment, the improvement in erythema, scaling, and folliculitis was significantly greater in the treatment group compared with the control group ( $P < 0.05$ ). Curative effect comparison showed that the total effective rate of the treatment group was 80.00%, compared with 25.67% of the control group, and the difference was statistically significant ( $P < 0.05$ ). *Conclusion:* 30% supramolecular salicylic acid combined with Yufa spray dressing can significantly improve the therapeutic effect in moderate to severe SDS; the recurrence rate is lower, the course of treatment is shortened, and patients generally feel better; thus, it is a new option for the treatment of dermatitis.

**Keywords:** Scalp seborrheic dermatitis; Supramolecular salicylic acid; Domain hair spray dressing

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## 1. Introduction

The scalp contains numerous sebaceous glands. The secretion of oil by sebaceous glands is a normal physiological response, but if excessive oil is secreted, it will accumulate on the scalp, thus leading to chronic inflammation at the site of accumulation<sup>[1]</sup>. Seborrheic dermatitis of the scalp (SDS) is generally believed to be related to factors such as genetics, abnormal sebum metabolism, abnormal microbial population, mental factors, and eating habits<sup>[2-5]</sup>. It can be divided into inflammatory and non-inflammatory seborrheic dermatitis. Non-inflammatory seborrheic dermatitis is often considered mild seborrheic dermatitis, characterized by scaling and, in some cases, accompanied by mild itching<sup>[6]</sup>. Moderate SDS,

which is commonly the inflammatory kind, is caused by excessive secretion of oil and may be accompanied by secondary fungal or bacterial infection, which can be manifested as typical erythema, greasy desquamation, and mild itching. In severe SDS, greasy yellow or brown scabs may appear, accompanied by erosion, exudation, and odor, and may even extend to the forehead, behind the ears, and other seborrhea sites [7]. SDS can be divided into three stages according to its clinical manifestations: acute stage, subacute stage, and chronic stage. In the acute stage, edematous erythema, papulopustule, exudate, and secondary infection will lead to erosion, ulceration, and alopecia. In the subacute or chronic stage, patients may present with erythematous skin patches, some of which are lichenified.

At present, there are two parts to the treatment of SDS, one of which is local treatment and the other is systemic treatment. If the skin lesions are localized, the main treatment is external medicine. Weak or intermediate glucocorticoids or calcineurin inhibitors can be used [8]. When selecting scalp lotions, ketoconazole-containing lotion or selenium disulfide lotion is the primary choice. If the skin lesions are widespread or in the acute stage, oral medications can be used, either antibiotics or antifungals. The antibiotics often used are tetracyclines, such as doxycycline hydrochloride or minocycline hydrochloride. However, long-term oral administration can cause antimicrobial resistance, resulting in reduced efficacy. Moderate to severe seborrheic dermatitis, associated with the overgrowth of *Malassezia*, should be treated with oral itraconazole [9]; however, its curative effect is uncertain, and it should not be taken by patients with abnormal liver function and blood lipids. Therefore, it is very important to find a safe and effective treatment that would also result in low recurrence rate.

The present study was conducted to determine the clinical efficacy of 30% supramolecular salicylic acid combined with Yufa spray dressing in the treatment of SDS and to explore the recurrence rate of the disease so as to provide a basis for the clinical treatment of SDS.

## **2. Methods**

### **2.1. General information**

From January 2020 to December 2021, a total of 150 patients with SDS who were treated in the Department of Dermatology of the First Affiliated Hospital of Xi'an Medical College were selected and randomly divided into two groups, a treatment group and a control group, with 75 cases in each group. In the treatment group, there were 40 male and 35 female patients, age ranging from 13 to 57 years, with an average age of  $32.5 \pm 5.27$  years; they were treated with 30% supramolecular salicylic acid combined with hair spray dressing on the basis of conventional external medicine. In the control group, there were 39 male and 36 female patients, age ranging from 14 to 59 years, with an average age of  $34.7 \pm 4.71$  years; they were treated with conventional oral medication and external medicine. There was no statistically significant difference in the general information between the two groups ( $P > 0.05$ ). This study was approved by the Hospital Medical Ethics Committee, and all the patients understood the purpose of this study and voluntarily participated in it under informed consent.

#### **2.1.1. Diagnostic criteria**

The diagnostic criteria for SDS as published in *Chinese Clinical Dermatology (2nd Edition)* in 2017 [10] are as follows: mild cases are characterized by small off-white or greasy yellow patches with base flushing, with or without mild itching; moderate cases are characterized by large, greasy and scaly patches with mild folliculitis, which may be accompanied by exudate and scab; severe cases are characterized by thick, greasy scab covering the scalp and numerous follicular papules, with or without alopecia.

#### **2.1.2. Inclusion criteria**

The inclusion criteria [10] of the present study were as follows: (1) patients with signs and symptoms that

correspond to moderate to severe SDS; and (2) patients who did not receive any treatment related to this disease within 1 week before treatment.

### **2.1.3. Exclusion criteria**

The exclusion criteria <sup>[10]</sup> included (1) patients with mild SDS (small, greasy scales, slightly red base, and mild itching); (2) patients who used systemic antifungals and antibiotics within 1 month; (3) patients with severe cardiovascular and cerebrovascular diseases, liver and kidney insufficiency, as well as mental illnesses; (4) pregnant and lactating women; (5) patients with serious local secondary infection; (6) patients who refused to be included in the study or whose curative effect cannot be determined due to incomplete data; (7) patients with other erythematous-squamous diseases, such as psoriasis, eczema, and tinea capitis; (8) patients with other scalp diseases.

## **2.2. Design**

### **2.2.1. Treatment**

Each patient's medical history was taken in detail before treatment, and each patient was informed of the precautions and possible side effects that could occur during treatment. The improvement of signs and symptoms and the occurrence of adverse reactions were recorded.

Control group: (1) oral administration of minocycline hydrochloride capsules (trade name: Meiman, Wyeth Pharmaceutical Co., Ltd.), 100 mg each time, 2 times/d; (2) fusidic acid cream (Aoluo, Hong Kong Aomei Pharmaceutical Factory, 5 g: 0.1 g), applied to pustules, papules, and nodules in the morning and evening, twice a day; (3) Qumixin cream (Sanyi, Sinopharm Group Sanyi Pharmaceutical Co., Ltd., 0.1 g), applied to itchy areas in the morning and evening, twice a day.

Treatment group: (1) external medicines prescribed to the control group; (2) 30% new supramolecular salicylic acid (Boleda, Shanghai Sibe Cosmetics Technology Co., Ltd.); the patients were required to use a disposable brush to brush salicylic acid evenly on the scalp after cleaning their scalp with a large alcohol cotton swab (the use of alcohol was to promote penetration in severe lesions), massage their scalp for 15–20 min, and wear a disposable plastic cap over their head for 30 min to promote absorbance; they were discouraged to bathe or wash their hair within 24 h of the treatment; the treatment was done once a month, and a course of treatment comprises 3 cycles of treatment; (2) Yufa spray dressing (Sichaqing, Yueshun Machinery Equipment 20190023 Bohui Meicui Bioengineering Technology Co., Ltd.), the patients were required to wash their hair 2–3 times/week in the following sequence: use their own personal care product; clean the dirt on the surface of their hair, and take an appropriate amount of Yufa spray dressing and apply it on the scalp, focusing on sites that are erythematous, scaly, and itchy, and with acne; use water and massage till foamy for 5–10 min to allow the active ingredients to be in full contact with the scalp; and then rinse off with water.

### **2.2.2. Precautions**

Since the occurrence of seborrheic dermatitis is related to daily life habits <sup>[11]</sup>, we paid attention to the patients' stress levels; sleeping habits by ensuring regular, adequate sleep; and eating habits by promoting the consumption of vegetables and fruits, while limiting the intake of fatty, high-polysaccharide, and spicy food in addition to alcohol.

## **2.3. Scoring criteria and evaluation**

### **2.3.1. Scoring criteria**

We referred to relevant literature and performed the clinical scoring according to the *Guiding Principles for Clinical Research of New Chinese Medicines*, in which points were accumulated based on the signs and

symptoms. The score at the time of enrollment was taken as the baseline; each symptom was scored separately, and the total score was calculated at the follow-up consultation <sup>[10]</sup>.

- (1) Scoring criteria for scales (based on the severity of desquamation): the scalp was divided into multiple areas for comprehensive scoring, or the area with the most severe dandruff was scored; any score above a specific threshold was used as the inclusion criteria for subjects <sup>[12]</sup>. The evaluation was done according to four levels: 0, 1, 2, and 3. No scales were given 0 points; scattered scales were considered mild and given 1 point; relatively dense scales were considered as moderate and given 2 points; innumerable densely fused scales were considered as severe and given 3 points.
- (2) Scoring criteria for erythema: no erythema = 0 points; light brown spot = 1 point; light red spot (moderate) = 2 points; bright red spot (severe) = 3 points <sup>[10]</sup>.
- (3) Scoring criteria for folliculitis: no papulopustule = 0 points; a few papulopustules (mild) = 1 point; denser papulopustules (moderate) = 2 points; innumerable fused papulopustules (severe) = 3 points.
- (4) Scoring criteria for pruritus: no pruritus = 0 points; mild pruritus, without affecting quality of life = 1 point; pruritus, affecting quality of life, but tolerable (moderate) = 2 points; extremely unbearable pruritus (severe) = 3 points <sup>[10]</sup>.

### 2.3.2. Efficacy judgment criteria

Subjective symptoms, including pruritus, greasy, burning sensation, and stinging pain, were scored according to the following severity: none = 0; mild = 1; moderate = 2; severe = 3.

Objective signs, including follicular papules, erythema, greasy scales, scabs, and exudation, were judged by an individual as follows: asymptomatic signs = 0; mild = 1 point; moderate = 2 points; severe = 3 points.

Efficacy index = (total score before treatment – total score after treatment)/total score before treatment × 100%; an efficacy index of ≥ 90% indicated cured; an efficacy index of 60%–89% indicated markedly effective; an efficacy index of 20%–59% indicated effective; and an efficacy index of < 20% indicated ineffective <sup>[13]</sup>. Effective rate = (cured + markedly effective) cases/total cases × 100%.

## 2.4. Determination of *Malassezia*

### 2.4.1. Specimen collection

Specimens were collected from the most severe dandruff areas by the file scraping method. A file was used to scrape off an area of 0.25 cm<sup>2</sup> from the top part of the scalp; the collected dandruff was placed on a glass slide, and 1 drop of enhancement solution (Su Tai Machinery, No. 20160170, Jiangsu Livetime Biotechnology Co., Ltd.) was added to it; a cover glass was placed on top and lightly pressed to fully combine the enhancement solution with the specimen and dissolve thick skin lesions, respectively.

### 2.4.2. *Malassezia* count

After a few seconds, the number of *Malassezia* spores were observed and recorded under a fluorescent microscope, and the spore density of *Malassezia* was graded and evaluated under the microscope at high power, along with its distribution density.

### 2.4.3. Direct counting method

Five fields of view under high-power lens were selected: 0 points = an average of less than 5 spores per high-power field of view (negative); 1 point = an average of 10 ± 3 spores per high-power field of view (+); 2 points = an average of 20 ± 5 per high-power field of view (++); 3–4 points = a large number or densely covered high-power field of view of ≥ 40 ± 10 spores (+++).

## 2.5. Statistical analysis

SPSS 22.0 was used for data analysis. Chi-squared test was used for the count data, while t-test or U test was used for the comparison between groups.  $P < 0.05$  was considered statistically significant.

## 3. Results

### 3.1. Changes in clinical scores

The changes in clinical scores before and after treatment are shown in **Tables 1** and **2**. A comparison of changes in scores after 12 weeks of treatment between the treatment group and the control group is shown in **Table 3**.

**Table 1.** Clinical scores of the treatment group before and after treatment

	Erythema	Scales	Pruritus	Folliculitis
Before treatment	1.89 ± 0.842	1.73 ± 0.699	1.61 ± 1.018	1.87 ± 0.736
4 weeks	1.56 ± 0.837	1.28 ± 0.623	1.23 ± 0.776	1.29 ± 0.455
8 weeks	0.95 ± 0.671	0.63 ± 0.606	0.69 ± 0.541	0.61 ± 0.487
12 weeks	0.36 ± 0.507	0.37 ± 0.560	0.68 ± 0.549	0.05 ± 0.225
<i>t</i>	17.49	16.1659	12.1655	20.7817
<i>P</i> -value	1.0298e <sup>-13</sup>	1.641e <sup>-13</sup>	5.9109e <sup>-12</sup>	1.1416e <sup>-14</sup>

Data are given in mean ± standard deviation.

Paired sample *t*-test and non-parametric Wilcoxon signed-rank sum test were used to compare the mean of clinical scores. The difference in clinical scores for erythema, scales, pruritus, and folliculitis before and after treatment was significant ( $P < 0.01$ ), indicating that supramolecular salicylic acid combined with hair spray dressing had a significant effect on alleviating the signs and symptoms of SDS and has an outstanding curative effect on various clinical symptoms of SDS.

**Table 2.** Clinical scores of the control group before and after treatment

	Erythema	Scales	Pruritus	Folliculitis
Before treatment	1.71 ± 0.891	1.80 ± 0.766	1.43 ± 1.073	1.97 ± 0.765
4 weeks	1.00 ± 0.783	1.43 ± 0.521	0.71 ± 0.779	1.03 ± 0.730
8 weeks	1.13 ± 0.772	1.36 ± 0.705	1.13 ± 0.869	1.27 ± 0.525
12 weeks	1.56 ± 0.809	1.16 ± 0.910	1.36 ± 0.995	1.84 ± 0.638
<i>t</i>	2.6204	1.4239	1.9235	3.0414
<i>P</i> -value	0.0126	0.3458	0.0726	0.0045

Data are given in mean ± standard deviation.

Paired sample *t*-test and non-parametric Wilcoxon signed-rank sum test were used to compare the mean of clinical scores. The difference in scores of erythema before and after treatment was significant ( $P < 0.05$ ), indicating that the traditional antibiotics used were effective in treating SDS. However, the difference in scores of other symptoms, such as scaling and pruritus, was insignificant ( $P > 0.05$ ), indicating that traditional antibiotics have no obvious curative effect on SDS.

**Table 3.** Comparison of changes in scores after 12 weeks of treatment between the treatment group and the control group

	<b>Erythema</b>	<b>Scales</b>	<b>Pruritus</b>	<b>Folliculitis</b>
Treatment group	0.36 ± 0.507	0.37 ± 0.560	0.23 ± 0.449	0.05 ± 0.225
Control group	1.29 ± 0.876	1.16 ± 0.910	1.17 ± 0.943	1.56 ± 0.697
<i>t</i>	-10.84	-12.6479	-5.3304	-14.9938
<i>P</i> -value	3.9365e <sup>-11</sup>	1.2082e <sup>-12</sup>	0.00	2.7884e <sup>-13</sup>

Data are given in mean ± standard deviation.

A mean comparison of clinical scores was performed by paired sample *t*-test and non-parametric Wilcoxon signed-rank sum test. At the 12th week, there was greater improvement in erythema, scales, and folliculitis in the treatment group than in the control group ( $P < 0.05$ ); there was also significant improvement in the pruritus score in the treatment group compared with the control group ( $P < 0.01$ ).

### 3.2. Evaluation of clinical efficacy

After 3 months of treatment, the treatment group achieved better results in terms of clinical efficacy. The effective rate of the treatment group (80.00%) was significantly higher than that of the control group (25.67%), and the difference between the two groups was statistically significant ( $P < 0.05$ ), as shown in **Table 4**.

**Table 4.** Comparison of clinical efficacy after 12 weeks of treatment between the two groups

<b>Group</b>	<b>Number of cases</b>	<b>Cured</b>	<b>Markedly effective</b>	<b>Effective</b>	<b>Ineffective</b>	<b>Effective rate</b>
Treatment group	75	40 (53.33)	20 (26.67)	15 (20.00)	0 (0.00)	80.00
Control group	75	8 (1.67)	18 (24.00)	30 (40.00)	19 (25.33)	25.67

Data are given in number of cases (%).

Out of the 75 cases in the treatment group, 40 patients (53.33%) were cured, 20 cases were markedly effective (26.67%), 15 cases were effective (20.00%), and none were ineffective. The total effective rate was 80.00%.

### 3.3. Recurrence rate of seborrheic dermatitis of the scalp

Four weeks after treatment, the recurrence rate of the treatment group was 10.7% (8 patients), which was lower than that of the control group (40%, 30 patients;  $P < 0.05$ ).

### 3.4. Example case

A dermatoscope (Dermat DER-II, China) was used to observe signs of erythema, scales, and blood vessels on the affected area of the scalp at each follow-up visit, and the same area was selected for retesting during the follow-up visits (**Figure 1**)<sup>[14]</sup>.



**Figure 1.** Observation of the affected area of the scalp with a dermatoscope during follow-up visits. (A) Day 0 of treatment. (B) Week 4 of treatment. (C) Week 8 of treatment.

### 3.5. Number of *Malassezia*

For this purpose, t-test was used. There was no significant difference in terms of the number of *Malassezia* between the treatment group and the control group before treatment ( $P > 0.05$ ), indicating that the two groups of patients were comparable. After a course of treatment, the difference between the treatment group and the control group was statistically significant ( $P < 0.05$ ). See **Table 5** for details.

**Table 5.** Comparison of the number of *Malassezia* in the treatment group and the control group

Group	Number of cases	Number of bacteria before treatment (per 0.25cm <sup>2</sup> )	Number of bacteria after treatment (per 0.25cm <sup>2</sup> )	t	P-value
Treatment group	75	2.68 ± 0.74	0.24 ± 0.43	34.06	5.7443e <sup>-47</sup>
Control group	75	2.71 ± 0.71	1.97 ± 0.84	13.38	1.904e <sup>-21</sup>
t		-0.2251	-15.94		
P-value		0.76	2.0807e <sup>-30</sup>		

Data are given in mean ± standard deviation

### 3.6. Patients' subjective evaluation

The patients themselves evaluated their degree of improvement with reference to their clinical symptoms. The scoring criteria were as follows: 0 points = aggravated; 1 point = no improvement; 2 points = slight improvement; 3 points = moderate improvement; 4 points = complete improvement. A score of 2 or more was considered valid. See **Table 6** for details.

**Table 6.** Subjective questionnaire scores

	Score			
	Treatment group		Control group	
	Before treatment	After treatment	Before treatment	After treatment
Overall improvement	3.43	3.02	3.23	0.42
Dandruff improvement	3.21	2.97	3.24	0.67
Oily scalp improvement	3.09	2.61	3.19	0.93
Scalp pruritus improvement	3.13	2.89	3.28	0.32

### 3.7. Safety evaluation

Scalp itching (2 cases), mild scalp tingling (4 cases), and eye irritation (1 case) were among the adverse effects observed. Scalp itching occurred only for a short period of time and was relieved spontaneously; in

the 4 cases of mild scalp tingling, the condition gradually disappeared after treatment; the patient who reported eye irritation claimed that it was relieved after washing with clean water.

#### 4. Discussion

SDS is a chronic papular, scaly disease, characterized by erythema, scales, and papules on the scalp, with or without pruritus. The initial skin lesions are follicular papules, which gradually expand and merge into yellow-red or dark red spots, covered with greasy scales or crusts, which may ooze, rot, or form scabs, accompanied by varying degrees of pruritus. The peak of its incidence is mainly concentrated in three age groups: three months before and after birth, adolescence, and adults aged 40–60 years<sup>[10]</sup>. Overgrowth of *Malassezia*, abnormal excessive oil secretion, and genetic susceptibility are the underlying pathogenesises. Other than that, spicy and irritating food, sleeping late, and fatigue can all lead to the recurrence or aggravation of SDS. In addition, some SDS patients have pruritus, characterized by repeated scratching; in severe cases, it may even lead to seborrheic alopecia<sup>[15]</sup>. The treatment of SDS focuses on clearing skin lesions and improving symptoms. Factors such as efficacy, side effects, ease of use/compliance, and age of patients should be fully considered before choosing a treatment plan<sup>[10]</sup>.

Generally, topical glucocorticoids have a better effect on scalp erythema and itching, but when used on the hair itself, it may cause scalp irritation<sup>[16]</sup>.

Systemic oral administration of tetracyclines has obvious curative effect on scalp inflammation; generally, the prescription of this class of drug for SDS does not exceed 4–8 weeks. However, due to the recurrence of SDS, its long-term use often leads to drug resistance and reduced therapeutic effect. The curative effect of oral antifungal drugs (mainly for large number of *Malassezia*) has yet to be validated. These drugs have not been widely used in clinical settings and are not suitable for patients with abnormal liver function and blood lipids.

Salicylic acid is a  $\beta$ -hydroxy acid extracted from willow bark, sweet birch bark, and *Gaultheria procumbens*. It plays a role in the following aspects: (i) anti-inflammation; its anti-inflammatory effect is equivalent to 63%–66% of phenylbutazone or indomethacin, 77% of aspirin, and 82% of hydrocortisone; (ii) broad-spectrum antibacterial agent; salicylic acid is effective against bacteria and has an inhibitory effect on all fungi; (iii) regulation of oil secretion; the lipophilicity of salicylic acid allows it to penetrate deep into hair follicles and improve inflammation<sup>[13]</sup>. Therefore, 30% supramolecular salicylic acid not only targets erythema and scales and improves inflammation in SDS, but also reduces oil secretion and is effective in improving folliculitis<sup>[13]</sup>. The treatment is once a month, with 3 cycles constituting a course of treatment.

Domain hair spray dressing is composed of two parts: the matrix and main components. The matrix is a surfactant system (composed of quaternary ammonium salt polymers, sodium lauroyl sarcosinate, and cocamidopropyl betaine) that acts as a carrier and, at the same time, plays two roles: cleaning and degreasing. This indirectly helps achieve oil control and antibacterial effects<sup>[10]</sup>. The main components are antimicrobial peptides, panthenol, and nicotinamide; panthenol can promote the proliferation and differentiation of keratinocytes and promote wound healing<sup>[10,17]</sup>. Nicotinamide, on the other hand, can reduce transepidermal water loss (TWEL) and sebum secretion as well as enhance skin barrier function when applied topically. Antimicrobial peptides, the third component, interact with bacterial and fungal cell membranes and destroy the structure and function of cell membranes to achieve bactericidal and bacteriostatic effects<sup>[18]</sup>. Artificially modified antimicrobial peptides have a smaller molecular weight and can easily penetrate the surface of the skin to achieve antibacterial effects. The helical structure of antimicrobial peptides is stable and can easily bind to the cell membrane of bacteria and fungi, enhancing antibacterial activity, physically destroying the cell membrane, and lowering the possibility of drug resistance<sup>[10,17,19,20]</sup>. Compared with traditional antibiotics, antimicrobial peptides are fast, powerful, and

broad-spectrum (including several bacteria that are highly resistant to traditional antibiotics). Compared with traditional antifungal drugs, antimicrobial peptide-based hair spray dressings have relatively low drug resistance, and the effectiveness of their re-use is predictable <sup>[10]</sup>. Yufa spray dressing can relieve the symptoms of seborrheic dermatitis from three aspects: oil control, antibacterial, and repair of skin lesions through the synergistic effect of the matrix and the main components <sup>[10]</sup>. As the rate of relapse of SDS after drug withdrawal is high, long-term maintenance treatment is particularly important. Choosing a low-irritation and safe lotion is an ideal way to maintaining treatment in the future.

In conclusion, 30% supramolecular salicylic acid combined with Yufa spray dressing in the treatment of moderate to severe SDS has several advantages, including less side effects, high compliance, and significant curative effect; furthermore, the degree of improvement of patients in terms of signs and symptoms and the application of the product are relatively satisfactory. Hence, it is worthy of clinical application. It provides a new treatment method for clinicians in managing patients with SDS. Yufa spray dressing, in particular, is an ideal substitute for SDS maintenance treatment and is worthy of clinical promotion.

### Disclosure statement

The authors declare no conflict of interest.

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