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Combination of Strontium Chloride 5% and Licorice 1% Solution Compared Mometasone Furoate Solution 0.1% for Dandruff

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Abstract; Pityriasis capitis simplex (Dandruff) is one of the most common scalp disorders with poor quality of life and pityriasic desquamation and pruritus on scalp. The main treatment options are antifungal agents and topical steroids. The aim of this study was to compare the clinical and symptomatic efficacy of strontium chloride hexahydrate 5% + licorice 1% combination (Storice®) with mometasone furoate 0.1%, a topical corticosteroid, in cases of pityriasis capitis simplex. 80 patients with a diagnodis of pityriasis capitis simplex were enrolled. 40 patients (20 males (50%), 20 females (50%)) were included in the mometasone furoate 0.1% group, and the remaining 40 patients (19 males (47.5%), 21 females (52.5%)) were included in the group of topical treatment agent (Storice®) consisting of strontium chloride hexahydrate 5% + licorice 1% combination. The clinical and symptomatic efficacy (pruritus and desquamation on scalp and life quality) of both agents were evaluated. Strontium chloride hexahydrate 5% + licorice 1% significantly reduces pruritus and improves quality of life by reducing clinical symptoms.

INTRODUCTION

The prevalence of seborrheic dermatitis is 3% and it can make a peak in the 3rd to 4th decade of lifetime. This skin disease is more common in men. Use of neuroleptics, Parkinson's disease and HIV are factors that facilitate seborrheic dermatitis [1]. Pityriasis capitis simplex (Dandruff) can be considered as the mild form of seborrheic dermatitis, especially affecting the scalp. Unlike seborrheic dermatitis, it affects 50% of the general population [2].

Etiopathogenesis of seborrheic dermatitis is not clear. Indirect evidence pointed out that Malassezia spp. may have a role. Endocrinopathies and metabolic changes were claimed to be associated with seborrheic dermatitis [3]. In a study conducted in our clinic, we reported that in patients with seborrheic dermatitis, a positive family history for metabolic syndrome and low HDL levels were associated with the presence of the disease [4].

In cases of pityriasis capitis simplex, squams and pruritus on the scalp are the most basic clinical findings. This clinical state significantly affects the quality of life in this patient group and causes the development of emotional problems such as impaired self-esteem [5]. In the USA, people spent 300 million dollars annually on "over-the-counter" products to relieve the complaints of squams and pruritus on the scalp [2].

Since pityriasis capitis simplex is a chronic disease with recurrent attacks, the main purpose of treatment is to relieve symptoms. Prevention of erythema, desquamation and pruritus on the scalp construct the basis of the treatment. Topical or systemic treatments are used for this purpose. Topical antifungal (ketoconazole) shampoos and corticosteroids are the main treatment approaches. Selenium sulfide and zinc pyrithion-containing shampoos are also used in treatment. Systemic antifungal agents (fluconazole) may also be used in treatment of unresponsive or resistant cases. Topical calcineurin inhibitors (pimecrolimus, tacrolimus) can also be used in treatment of cases where topical corticosteroids cannot be used or unresponsive cases, but scalp preparations of these drugs do not exist. Only topical corticosteroid lotions and some tars are available as treatment options on the scalp [6-9].

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Recurrent topical treatments in cases proceeding as attacks may cause side effects especially related to topical steroids. Therefore, there is a need for different topical treatment options to control the symptoms of the disease besides the current treatments. Pruritus control is important in this patient group as in other similar diseases. Topical treatments that can actively control pruritus are significant for the control of pityriasis capitis simplex and to improve the quality of life in patients. Preparations in the form of topical hair lotion containing strontium chloride hexahydrate and/or licorice, which are known to have anti-inflammatory and prominent antipruritic properties, can be used in the control and maintenance of these symptoms by preserving the moisture and barrier integrity of the scalp. These topical preparations do not have any known side effects in long-term use [10, 11].

The aim of this study was to compare the clinical and symptomatic efficacy of strontium chloride hexahydrate 5% + licorice 1% combination (Storice®) with mometasone furoate 0.1%, a topical corticosteroid, in cases of pityriasis capitis simplex.

MATERIAL and METHODS

Ethics committee approval

Ethics committee approval of the study was obtained from Cumhuriyet University Clinical Research Ethics Committee with the decision numbered 2020-10/03.

Patients and study design

The presence of a comorbid disease in the patients was determined by the history of patient and hematological examinations that are routinely used in examination and follow -up of these patients. For this purpose, hemogram, complete biochemistry, sedimentation, CRP and TSH levels were checked. Patients with a history of hypertension or an endocrinopathy, pediatric patients, pregnant women, patients over 65 years of age, patients diagnosed with neurological diseases, HIV positive patients were not included in the study.

Eighty patients who applied to the Dermatology outpatient clinic of Sivas Cumhuriyet University Faculty of Medicine and were diagnosed with pityriasis capitis simplex, who had not been treated for the last four weeks, participated in the study. The patients included in the study were randomly divided into two age- and gender-matched treatment groups. After obtaining the consent of the patients, topical treatment agent (Storice®) consisting of strontium chloride hexahydrate 5% + licorice 1% combination was given to one group and mometasone furoate 0.1% hair lotion to the other group, to be applied on the scalp twice a day by the patients. The clinical and symptomatic efficacy of both agents were compared. Visual Analogue Scale (VAS) was applied to evaluate pruritus (scalp pruritus score) (SPS Score). Dermatology Life Quality Index (DLQI), which is commonly used in dermatological diseases, was used to evaluate the quality of life. The amount of desquamation in the scalp of the patient was determined by the physician using the scalp lesion score (SLS Score) [12].

Visual Analogue Scale (VAS, SPS Score) and scalp lesion score were evaluated before treatment, in the first week of treatment and after treatment, and DLQI was evaluated before and after treatment.

Statistical analysis

The data obtained from our study were evaluated by uploading to the SPSS (V22.0) software. Since the data did not conform to the normal distribution according to the normality test (Shapiro-Wilk) and there were three repetitive measurements, the Friedman test, a non-parametric test, was used. Wilcoxon test was used to compare two dependent groups. Mann Whitney U test was used to compare two independent groups. The level of error was taken as 0.05.

RESULTS

Of the 80 patients (41 females (51%), 39 males (49%)) with a diagnosis of pityriasis capitis simplex who participated in our study, 40 patients (20 males (50%), 20 females (50%)) were included in the mometasone furoate 0.1% group, and the remaining 40 patients (19 males (47.5%), 21 females (52.5%)) were included in the group of topical treatment agent (Storice®) consisting of strontium chloride hexahydrate 5% + licorice 1% combination.

The mean age of the patients was 30.6 ± 12.25 years, and the mean disease duration was 7.9 ± 7.5 months. The mean age was 30.3 ± 11.8 years in the patient group using mometasone furoate 0.1%, and 30.9 ± 12.8 years in the patient group using strontium chloride hexahydrate 5% + licorice 1% (Storice®). The mean disease duration was 6.2 ± 5.08 months in the patient group using mometasone furoate 0.1%, and 9.6 ± 9.1 months in the patient group using strontium chloride hexahydrate 5% + licorice 1% (Storice®). Table 1 shows the results of statistical analysis (Figure 1-3).

Table 1. The results of the statistical analysis in both groups.

Measurements	Treatment groups		p
	Mometasone furoate 0.1% hair lotion	Strontium chloride 5%+licorice 1% hair lotion (Storice®)	
	Median±IQR (Percentile 25-Percentile 75)	Median±IQR (Percentile 25-Percentile 75)	
DLQI before treatment	9±3,5(8-11,5)	11±7(9-16)	0,096
DLQI after treatment	3,5±4(2-6)	5±4(4-8)	0,002
p	<0,001	<0,001	
SLS Scores before treatment	13±13,5(8,5-22)	14±15,5(8,5-24)	0,569
SLS Scores first week	7±6(5-11)	9,5±10(7-17)	0,006
SLS Scores after treatment	2±4(1-5)	6±10(2-12)	0,001
p	<0,001	<0,001	
SPS Scores before treatment	7±3(5-8)	6,5±3(5-8)	0,807
SPS Scores first week	2±1,5(1,5-3)	2±2(1-3)	0,634
SPS Scores after treatment	1±1(1-2)	0,5±1(0-1)	<0,001
p	<0,001	<0,001	

*p< 0.05 significant

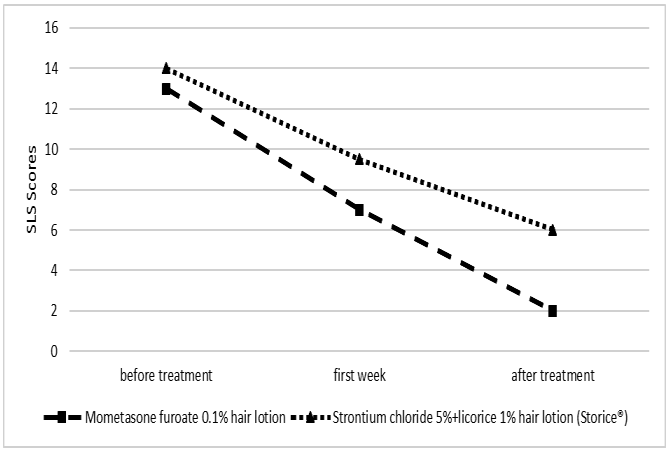

Figure 1. SLS scores in patients groups

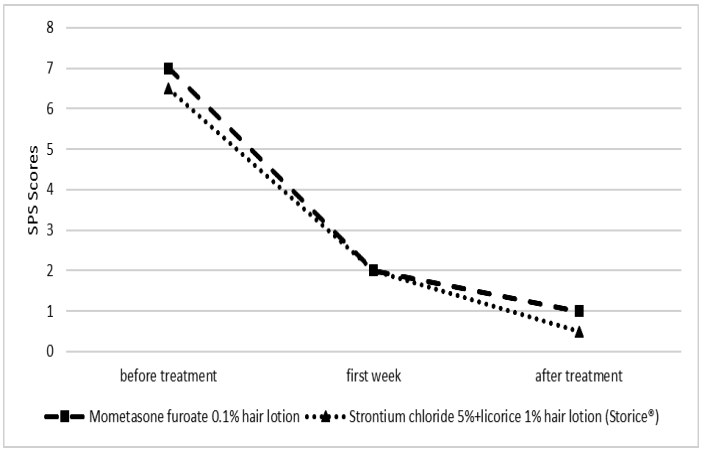

Figure 2. SPS scores in patient groups

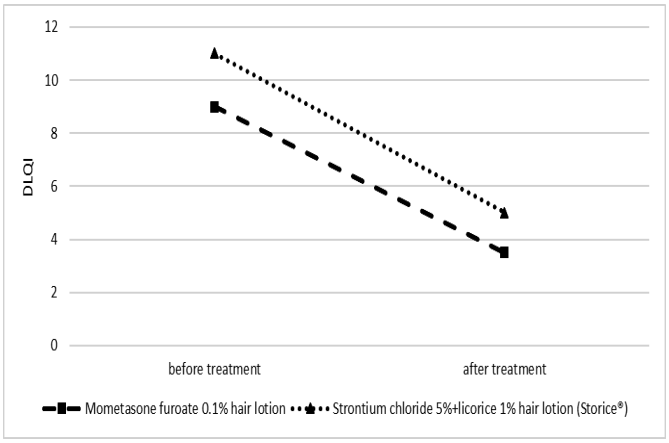

Figure 3. DLQI scores in patient groups

DISCUSSION

Pityriasis capitis simplex is a chronic, recurrent inflammatory disease of the scalp. It is characterized by pityriasic desquamation and itching of the scalp and affects a significant part of the world population. Various internal and external factors are responsible for the development of the disease [2, 13, 14].

Although Malassezia is an important factor, inflammatory responses related to personal predisposition also play an important role in the pathogenesis of the disease [2, 13, 14]. As a matter of fact, obtaining a successful clinical response in patients who receive only antifungal therapy may not be possible [14].

Basic treatment options include antifungal agents, keratolytics and keratostatics, anti-inflammatory agents, anti-sebum agents, and immunomodulators [15]. The most commonly used anti-inflammatory agents are topical corticosteroids. For this purpose, low and mid-potency strength topical steroids can be used in the form of hair lotion. Although they have an important role in the control of pityriasic desquamation and pruritus with their rapid effects, development of atrophy and similar side effects with long and frequent use of topical corticosteroids is possible. Therefore, in the treatment of pityriasis capitis simplex located on the scalp, particular anti-inflammatory and antipruritic effective options are needed in addition to topical corticosteroids. As an alternative to topical steroids, there are immunomodulatory effective calcineurin inhibitors such as pimecrolimus and tacrolimus, but the lack of appropriate topical forms for the scalp limits their use [13-16].

Strontium is a trace element and a competitive inhibitor of calcium. It inhibits the flow of calcium into the cell and may indirectly reduce the expression of proinflammatory cytokines [10,17,18]. In a study conducted in our clinic, we have shown that strontium chloride hexahydrate 5% cream suppresses the inflammatory phase in the wound healing model [10]. Strontium salts are also effective in reducing skin irritation and can effectively block the burning-stinging sensation and itching [19, 20].

Licorice is a perennial herb. One of the major components of Licorice root extract is 18b-Glycyrrhetinic acid. Glycyrrhetinic acid can be used effectively in suppressing the inflammatory response and reducing pruritus in eczema [21-24].

In this comparison study of topical Strontium chloride hexahydrate and licorice combination with topical mometasone in pityriasis capitis simplex cases with anti-inflammatory and antipruritic effects, similar clinical and symptomatologic efficacy emerged in both treatment groups at the end of two weeks of treatment.

In our study, mometason furoate 1% is more effective than Strontium chloride and licorice combination (Storice®) in reducing scalp desquamation. On the other hand,it is remarkable that the combination of Strontium chloride hexahydrate and licorice has a significant effect especially in the control of pruritus. The antipruritic effect of this combination can be explained by two mechanisms: 1- Antipruritic effect of strontium salts blocking of calcium-mediated P substance release [20], 2- Indirect antipruritic effect of licorice with its anti-inflammatory effects [25].

Quality of life is an important factor in the treatment of this community-common disease. Significant improvements were observed in dermatological quality of life scores in both treatment groups. Although the control of the pruritus of Strontium chloride hexahydrate and licorice combination (Storice®) significantly affects the quality of life positively, our results shows that mometasone furoate effect is more pronounced in improving the quality of life.

In the present study, no significant adverse effects were noted in either treatment group.

The limitations of this study are that the placebo group was not used and the long-term treatment effects such as maintenance, recurrence and side effects were not evaluated.

The combination of Strontium chloride hexahydrate and licorice (Storice®) significantly reduces pruritus and improves quality of life by reducing clinical symptoms in cases of pityriasis capitis simplex, which is a frequently recurring chronic inflammatory disease. The results of our study point out that this combination may be used safely and effectively to provide maintenance alone or in combination with topical steroids or after topical steroids in the cases with pityriasis capitis simplex, especially in cases requiring long-term treatment in clinical practice.

Conflict of interest

Melih Akyol, who is one of the authors of this publication, has a commercial relationship with Drogsan medicine company through “Cumhuriyet Teknokent.”

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