Clinical efficacy of mucopolysaccharide polysulfate ointment combined with desonide ointment in treatment of infantile eczema

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Abstract: To observe and analyze the clinical efficacy of mucopolysaccharide polysulfate (MPS) ointment combined with desonide ointment in treatment of infantile eczema. A total of 180 infants who had been treated for eczema at our hospital were enrolled. The patients were divided into control group accepting desonide ointment only and research group accepting mucopolysaccharide polysulfate ointment and desonide ointment. The therapeutic efficacies of two groups were compared. Results: By comparing the total therapeutic efficacy, results showed that the total efficacy of the research group was 96.67%, while that value of the control group was 82.22%, making the total efficacy of the research group significantly higher ($p<0.05$). And the improvement of the Eczema Area and Severity Index (EASI) score in the research group after drug administration was significantly better than that of the control group ($p<0.05$). Moreover, there was a greater decrease in the recurrence rate of the research group than that of the control group ($p<0.05$). Combined application of mucopolysaccharide polysulfate ointment and desonide ointment can achieve better therapeutic effect in treatment of infantile eczema.

Keywords: Mucopolysaccharide polysulfate ointment, desonide ointment drug combination, infantile eczema.

INTRODUCTION

Infant eczema, also known as "milk ringworm", is a relatively common skin disease for infants and young children. Infant eczema can be found as early as 2-3 months years old, but the incidence is significantly reduced after 2 years old. Most of the infant eczema occurs on the cheeks, forehead, the area between the eyebrows and the head. In severe cases, it can occur on trunk and limbs. The causes of infantile eczema are complex, including both internal and external factors, which area difficult to be identified (Zhang Tang and Zhang, 2017; Stanzia Qian and Yang, 2015). There are internal factors such as imbalance of immune function or immunodeficiency, endocrine diseases, nutritional disorders, chronic infections, tumors and other systemic diseases, hereditary or acquired skin barrier dysfunction; while the external factors mainly include food allergens intake, such as milk, fish, shrimp, beef and mutton, eggs and other sensitizing factors, or the presence of allergens in the environment, which can cause type I allergic reactions (Iwata Masuda and Ohno, 2016; Lee Kim and Kim, 2017; Ouyang *et al*., 2018). At the same time, mechanical friction, such as saliva and galactorrhea, is also the cause of infantile eczema.

Infant eczema (shown in fig. 1 below) is itchy, prone to exudation, and is usually recurrent. According to relevant survey data, the incidence of infant eczema has gradually increased in recent years. Especially in the dry northern autumn and winter season, it is easy for a baby to get eczema (Xu Yan and Jiao, 2016). Medication is an important treatment for infant eczema, which normally can produce good results. In this study, the clinical efficacy of mucopolysaccharide polysulfate ointment combined with desonide ointment was observed in treatment of infantile eczema (Gao Wang and Wang, 2017; Khan Jamal, 2018; Ozcakar Toprak Ergonen and Kartal, 2017; Xiong *et al*., 2018).

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MATERIALS AND METHODS

General data

A total of 180 infants who had been treated for eczema at Northwest Women's and Children's Hospital from August 2016 to August 2018 were enrolled research objects (Razzak *et al*., 2018). This paper has a rigorous structure, and the conclusion has been approved by relevant ethics and relevant departments. All cases were definitely diagnosed with relevant clinical examinations (as shown in fig. 2). The family members of all patients enjoyed the right to know and signed the formal consent form. The inclusion criteria were as follows: infants aged between 2 months to 2 years; the eczema was mainly presented on face with subacute and dry lesions; pap, erythema, scales and dryness are the main clinical manifestations. The exclusion criteria were listed as follows: Patients accepting other corticosteroid topical preparations or systematic application of corticosteroid within two weeks; patients that are allergic to mucopolysaccharide polysulfate ointment or desonide ointment; patients with apparent exudation at the rash area; patients who are complicated with bacterial or fungal infection; complicated with capillary expansion; complicated with fever, cough, etc (Pandarekandy Sreejesh and Thampi, 2017; Rather Kim Bajpai, 2017; Vural Mert and Erhan, 2017; Chen, Su and Huang, 2018).

Fig. 1: Infantile eczema

Patients were randomized into research group and control group, with 90 patients in each group. There were 50 male patients and 40 female patients in the research group, with average age of (6.3±0.9) months, ranging from 2 months to 2 years, and with an average disease course of (1.4 ± 0.5) months (Rabbani *et al*., 2018). There were 48 male patients and 42 female patients in the control group, with average age of (5.9±1.2) months, ranging from 2 months to 2 years. and with an average disease course of (1.1 ± 0.9) months. There was no significant difference in general data between two groups (p>0.05).

Fig. 2: Infantile eczema

Methods

Different therapeutic regimens were applied on infants of both groups. The patients in the control group were treated with desonide ointment only, while those in the research group were subjected to combined application of mucopolysaccharide polysulfate ointment and desonide ointment. Instructions for desonide ointment: desonide ointment (Huapont Pharmacy, H20060725) was smeared evenly on the infected part with fully massage, twice a day (once in the morning and once in the evening) (Farid *et al*., 2018). Instructions for mucopolysaccharide polysulfate ointment: mucopolysaccharide polysulfate ointment (Mobilat Produktions GmbH, H20150011) was smeared evenly on the infected part with fully massage, twice a day (once in the morning and once in the evening). Infants of both groups were treated for half a month, and the therapeutic efficacy was evaluated and compared.

Observation indexes

The overall effective rates of both groups were observed, including fully recovered, significantly effective, effective and ineffective. Full recovery is defined when rashes completely disappear and all symptoms are removed (Huang Li and Li, 2016; Danishada Sharmaa and Saha, 2017; Reddy and Aqueel, 2018); significantly effective is defined upon disappearance of more than 60% of rash and significant alleviation of the symptoms; effective is defined upon disappearance of 30-60% of rash and slight alleviation of the symptoms; and ineffective is defined upon disappearance of less than 30% of rash and no changes of the symptoms. Moreover, recurrence refers to presentation of cutaneous pruritus, erythema and papule. The EASI score is used to evaluate the patient's situation. The severity of the clinical symptoms is evaluated by 3-point system, where 0 point refers to no symptom, 1 point refers to mild symptom, 2 points refers to moderate symptom, and 3 points refers to severe symptom.

STATISTICAL ANALYSIS

Statistical analysis was performed using SPSS21.0. All quantitative data were expressed in the form of mean ± standard variance (x ± s), with t-test used for inter group comparison. Enumeration data were expressed in the form of natural number (n) + percentage (%), with chi-square test for inter group comparison. *p*<0.05 represents the intergroup difference was of statistically significance.

RESLUTS

Comparison of the overall effective rate between two groups

As shown in table 1, with different treatment, the overall effective rate of the research group was significantly higher than that of the control group (p<0.05).

Comparison of the EASI score before and after treatment between both groups

As shown in table 2, there was no significant difference in the EASI score between both groups before treatment (p>0.05). After treatment, the improvement of the EASI score in the research group was significantly better than that of the control group (p<0.05).

Comparison of the recurrence rates between two groups

The recurrence rates in two weeks after recovery for both groups were evaluated. Results showed that the recurrence rate of the research group was significantly lower than that of the control group (p<0.05), as shown in table 3.

Table 1: Comparison of the overall effective rate between two groups [n (%)]

Group	Fully recovered	Significantly effective	Effective	Ineffective	Overall effective rate
Research group (n = 90)	57	20	10	3	87 (96.67)
Control group (n = 90)	24	27	23	16	74 (82.22)
X^2					12.20
p					0.31

Table 2: Comparison of the EASI score before and after treatment between two groups ($\bar{x}$ ± s)

Group	Cases	EASI score before treatment	EASI score after treatment
Research group	90	2.98 ± 0.12	0.22 ± 0.24
Control group	90	2.90 ± 0.51	1.56 ± 0.36
t		0.29	6.48
p		0.286	0.025

Table 3: Comparison of the recurrence rates between both groups [n (%)]

Group	Number of cases	Number of recurrence cases	Recurrence rates (%)
Research group	90	5	5.56
Control group	90	17	18.89
X^2			9.04
p			0.008

DISCUSSION

Infantile eczema is a common allergic skin in infants, which tends to occur on the head and face. The skin lesions are accompanied by paroxysmal itching, so that the children rub and scratch, fret and cry, which seriously affect sleep and health. The treatment for this disease is mainly medication, normally glucocorticoid combined with antihistamines are used. Infants and young children have thin cuticle, tender skin, less sebum secretion, so their skin have relatively weak protective effect, and adverse reactions occur easily after absorbing drugs. Therefore, fluoride-freehormones with less side effects should be selected, and the duration for external use of glucocorticoid therapy should be controlled around two weeks (Sharma Danishad and Seenu, 2017; Xu Zhou and Wu, 2016; Fei Chen and Xue, 2018).

The active ingredient of mucopolysaccharide polysulfate ointment is low molecular heparin with a molecule weight of 5-15 KD, which has good permeability and absorptivity. It can rapidly penetrate through the skin into the subcutaneous tissue and dermis. By inhibiting the activity of protease and hyaluronidase in the tissue, it can inhibit the synthesis of prostaglandin, restore the ability of water retention and promote the metabolism and regeneration of connective tissue, thus exerting favorable moisturizing function. Also, it can facilitate local blood circulation by acting on blood clotting and fibrinolytic system. Mucopolysaccharide polysulfate ointment has significant curative effect in the treatment of chronic eczema of shanks and hands, corticosteroid-dependent dermatitis on the face, asteatosis, chapped skin disease of hands and feet, scar, atopic dermatitis. As a synthetic non-halide weak-potency glucocorticoid, desonide ointment has the functions of anti-inflammatory, anti-allergy, itching-relieving and vasoconstriction. It can eliminate the fever and swelling caused by local non-infectious inflammation, thus alleviating the inflammatory response. With rather high safety, desonide ointment has high safety and normally will not cause serious adverse effects.

Results of this study showed that the overall effective rate of the research group was 96.67%, while that value of the control group was 82.22%, there was a significant difference in overall effective rate between the two groups ($p<0.05$). The improvement of the EASI score in the research group after treatment was significantly better than that of the control group ($p<0.05$). Moreover, there was a lower recurrence rate in the research group than that of the control group ($p<0.05$). The above findings are in line with previous study.

CONCLUSION

In conclusion, mucopolysaccharide polysulfonate ointment and desonide ointment are weak glucocorticoid preparations, which can also produce great therapeutic effects against infant eczema, but the combined treatment of the two is more effective. The application of MPS ointment combined with desonide ointment in the treatment of infant eczema can achieve good results, significantly improve the overall effective rate and reduce the recurrence rate, with good safety and reliability. Therefore, the combined application of mucopolysaccharide polysulfonate ointment and desonide ointment can be widely used in clinical practice, which is of great significance.

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