**TOPICAL USE OF STEROIDS IN THE AGED***

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** Abstract:** Steroid preparations for topical use include a variety of forms, among them hydrophobic ointments, emulsions, liquids, and gels. These drugs are chosen according to the status and site of the lesion and the patient's age. There are five grades of steroid preparations for topical use in terms of the potency of their clinical effect. The skin of elderly persons tends to be dry and therefore does not absorb steroids well. However, if steroids of high potency are used for a long period, elderly patients are apt to suffer side effects of steroid application, including enhanced atrophy, purpura, xeroderma, capillary telangiectasia, delayed wound healing, and susceptibility to infection, because their skin is atrophied. In the elderly, the skin becomes dry as it loses its ability to retain water. To treat pruritus and asteatotic eczema under these conditions, steroid preparations of mild to moderate potency and having a hydrophobic base should be used. If nummular eczema or autosensitization dermatitis has occurred as a result of scratching, steroids of higher potency should be selected. Emulsions are not suitable for moist lesions like erosions and ulcers, because of the issues of reabsorption and stimulation. Although seborrheic eczema and psoriasis are common in the elderly, the former requires short-term steroids of moderate or lower potency, whereas the latter requires the cautious use of stronger steroids.

**Key words:** Steroid preparations for topical use; Local side effects of steroids; Indications of topical steroid therapy in elderly patients

**Introduction**

Among various drugs available for the treatment of skin diseases, adrenocortical hormones are the most common and most frequently used because of their potent anti-inflammatory action. Although systemic steroid therapy by oral administration or injection is employed in some cases, topical steroids are generally used in the treatment of most dermatologic diseases. Some cautions, however, are important with regard to steroid use. The condition of the skin as well as the pharmacology of adrenocortical hormones (steroids) should be borne in mind when applying steroids to the skin.

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Steroid Preparations for Topical Use

1. Topical steroids
   In 1952, Sulzberger and Witten first reported the topical application of a steroid in the treatment of dermatosis. The steroid used was 17-hydroxycorticosterone-21-acetate. Following their report, halogenation of the steroid skeleton at hydroxyl groups located at the C-6, -9, and -21 positions, esterification at C-17 and -21, and acetylation at C-16 and -17 were found to enhance the anti-inflammatory action of steroids, and various potent steroids for topical use have been developed. On the other hand, as more potent steroids have become available, accompanying side effects have arisen as a problem.

2. Types of topical steroid preparations and their effects on steroid efficacy
   Various forms of topical steroids are available, and they are selected according to the lesion to be treated.
   (1) Hydrophobic ointments
       Hydrophobic ointments do not contain water, but have fat or oil bases like water-insoluble petrolatum. Although hydrophobic ointments are sticky, they are minimally irritating to the skin and are applicable to erosions and ulcers. Steroid ointments with a petrolatum base are widely used, and steroid ointments of this type are, in general, simply referred to as “steroid ointments”.
   (2) Emulsions
       Emulsions, which are a mixture of normally non-mixable fat and water emulsified with a surfactant, are divided into the oil-in-water (o/w) type and the water-in-oil (w/o) type. Steroid creams are mostly of the oil-in-water type and can be washed away with water. Because of this, they are reabsorbed from the erosive or ulcerative surface and therefore cannot be applied to a macerated surface. Creams of the w/o type are more difficult to wash away with water than those of the o/w type. Universal creams are used as bases of steroid creams.
   (3) Lotions
       Lotions are o/w- or w/o-type emulsified liquids. Most steroid lotions are of the o/w type. In recent years, shakable steroid-suspension lotions have become available.
   (4) Gels
       Steroid gels have solid or semisolid suspension bases that can be divided into hydrogel and lyogel bases. The former are transparent bases that form a capsule when applied to the skin, while the latter are also known as FA PG bases, and have a texture intermediate between ointments and creams.
   (5) Sprays
       Steroid sprays are steroid solutions atomized by gas pressure. Although they are advantageous in terms of extensive application, an important drawback is that it is difficult to estimate the exact amount being applied.

3. Indications of topical steroid therapy
   Steroid preparations for topical use are generally classified into five grades: strongest, very strong, strong, medium or mild, and weak, in order of potency.
Even when the same steroid is used, ointments and creams may rank differently because of the base that was used.2,4)

Although steroid preparations may be selected on the basis of the diagnosis, most frequently the form and site of the lesion and the patient’s age are decisive factors. While hydrophobic ointments are sticky and glossy, they can be used for almost all lesions, including erythema, papules, chronically lichenified surfaces, erosions, and ulcers. Since cream bases are water-soluble, being reabsorbed after having been dissolved in effusions, and are also irritants, they are not suitable for erosions and ulcers.3)

4. Side effects of topical steroids

(1) Local side effects of topical application

1) Side effects of steroids themselves

(Table 1).2,4,5) Even when the same steroid is used, ointments and creams may rank differently because of the base that was used.2,4)

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Table 2 shows possible adverse reactions to topical steroids.\textsuperscript{2,4,5} The higher the grade of steroid and the longer its period of application, the more often adverse reactions occur. Adverse reactions are also more likely to occur when the steroid is applied by occlusive dressing therapy (ODT) than by simple topical application. Contact dermatitis caused by steroids themselves is well known. If the disease state remains unchanged or is aggravated with the topical use of a steroid preparation, it is necessary to suspect contact dermatitis due to the steroid.

2) Side effects of the base or formulating ingredients
Surfactants used in the base, lanolin, propylene glycol, and supplemented aminoglycoside antibiotics such as neomycin may cause contact dermatitis.

2) Systemic side effects after topical application
Percutaneously absorbed steroids can exert systemic effects. When a strong steroid at a dose of 15–30g/ day is applied by ODT, hypoadrenalism, eosinopenia of the peripheral blood, accumulation of Na and water retention, and cushingoid signs may occur. However, these changes resolve soon after the steroid is discontinued. It has been reported that hypoadrenalism seldom occurs after simple topical application at a daily dose of less than 10g.\textsuperscript{2}

To prevent systemic effects of steroids absorbed from the skin, various antedrugs have been developed. Steroids that are unlikely to be absorbed from the skin or that lose glucocorticoid activity and are metabolized within a short period of time, even if absorbed, are especially desirable. The recent development of topical steroids has been aimed at designing clinically effective preparations that are free

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Steroid Preparations for Topical Use in Elderly Patients

1. Effects of topical steroids on the skin of elderly patients

In the elderly, the skin is dry and steroids are poorly absorbed. However, aged, atrophied skin is susceptible to steroid-induced skin atrophy, peliosis, and steroid skin injury, changes that are difficult to resolve once they occur. Senile dermatoses follow a chronic course, are intractable, and require prolonged topical application of steroids, which then can lead to adverse reactions to the drug. Steroids of an appropriate grade should be chosen according to the lesion and should be applied for as short a period as possible.

The skin of the face is thin, particularly in the perioral and periocular areas, as is skin in the genitocrural and perianal regions, and axilla. Since these areas are susceptible to steroid-induced atrophy, due caution is necessary in selecting the grade of steroid to be applied.

2. Common major dermatoses requiring topical steroids in the aged and the usage of such steroids

(1) Pruritus

This condition, in which the patient complains of severe itching although no particular eruptions are present, is especially common in the winter. Pruritus may accompany skin dryness in diabetes mellitus, chronic liver disease, and dialysis or visceral lesions including malignant tumors. Patients often suffer itching of the skin when they become warmer as a result of improved blood circulation, particularly after bathing, in bed, or while using an electric blanket. Patients may indeed scratch their skin until it becomes sore, a situation that is more apparent as people grow older, representing a common problem among the elderly.

Application of an oily ointment or body oil after bathing, when the skin is moist, is effective. When symptoms are severe, the use of a steroid ointment of the medium grade is recommended.

(2) Asteatotic eczema

An eczematous lesion that develops from pruritus through scratching is called asteatotic eczema. Application of a medium or strong steroid ointment is indicated. Simple embrocation once or twice a day is adequate. This lesion commonly occurs in winter, and is frequently located on the lateral sides of the lower legs and in the dorsolumbar region. In addition to people of middle or advanced age, this lesion has recently been seen in young people who work in dry, ventilated rooms.

(3) Nummular eczema

Pruritus complicated by scratching and infection with staphylococci or other bacteria forms a surface the size of a coin or egg yolk, accompanied with erosions, effusions, and sludgy crust formation.

Simple topical application of a steroid ointment is not adequate for this type of lesion, and superposing zinc ointment on the steroid ointment is required. After the crust has been eliminated, simple embrocation of the steroid ointment is employed. Strong or very strong steroid ointments are appropriate. Strongest
steroid ointment may also be used, but only for a short period of time.

(4) **Seborrheic eczema**

Although this type of eczema is particularly common in the neonatal period, puberty, and adolescence, it frequently occurs in people of middle or advanced age as well. The lesion involves the face or head, with the seborrheic area having an erythematous surface with pityroid desquamation. Antimycotic agents such as ketoconazole may be used for facial lesions. In intractable cases, a weak or medium steroid ointment may be used for a short period.

(5) **Psoriasis vulgaris**

This lesion occurs relatively frequently in people of middle or advanced age. Although treatment may vary according to the disease state, a strong steroid ointment is usually applied to rashes on the trunk. An occlusive dressing may be employed on some occasions.

**Conclusion**

The skin of the elderly does not permit good percutaneous absorption. Further, it is thin and apt to be adversely affected by the application of topical steroids. Thus, local adverse reactions are likely to occur, leading to skin atrophy, purpura, and capillary telangiectasia.

Steroid preparations for topical use are available in various forms, which should be chosen according to the characteristics of the cutaneous lesion in question. Ointment bases such as petrolatum are applicable to a variety of lesions. In contrast, cream bases are not appropriate for moist lesions including erosions and ulcers because they are dissolved in effusions and reabsorbed. Steroid preparations for topical use are classified into five grades in terms of the potency of clinical effect. It is necessary to choose a steroid agent of the grade suitable for the cutaneous lesion and lesion site. Since cutaneous lesions in the aged are often intractable, due consideration of the potency and form of dosage is required when using topical steroid therapy.

**REFERENCES**