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Local atrophy of the cheek skin and hirsutism in a 3-year-old child following corticosteroids treatment

Corticosteroids therapeutically used at present are synthetic derivatives of suprarenal cortex hormones (cortisone, cortisol, corticosterone) (2). The topical glucocorticoids (GCs) have a multi-plicity of actions: anti-inflammatory, immunomodulatory, vasoconstrictory, gluconeogenic and anti-mitotic (1). The anti-inflammatory effect is achieved through vasoconstriction, decreased capillary permeability, and inhibition of leukocyte proliferation and migration (3). The anti-inflammatory effects are based on stabilization of lizosomal membranes, inhibition of prostaglandinds absorption, lymphocytes and monocytes migration, antigen-antibody reaction, occurrence of delayed-type hypersensitivity reactions, as well as swelling effect in Arthus reaction (10). After topical application on the skin they constrict blood vessels, which is used in vasoconstriction test according to Mc Kenzie i Stouhgton for assessment of the strength of these drugs (5). Topical GCs are prescribed for the treatment of many inflammatory conditions and today they represent the drug type of choice for the treatment of most dermal inflammatory disease (1). GCs are used both for general and local treatment of skin diseases (5). In selecting the most appropriate steroid preparation to use, among the vast array currently available, the clinician must consider the severity and localization of the disease, the risk of drug-induced adverse reactions, the age of a patient and the potency of various agents (9). Glucocorticosteroids are drugs of choice in eczema, contact eczema, atopic dermatitis, lichen planus, insects and arthropoda bites, burns, keloids; in others skin diseases they can be prescribed as alternative or additional drugs, and in some diseases they can be used with good therapeutical effects (2).

The strength of glucocorticosteroids action depends on physicochemical properties of the drug used and, first of all, on receptor affinity (2). Glucocorticosteroids are best absorbed from mucosal surfaces, perineum region, skin folds and palpebrae (5). With prolonged use, the anti-proliferative activity of corticosteroids may cause problems with atrophy (3). The epidermal atrophy is the main side effect of topical glucocorticosteroids' administration (5). The skin thinning and atrophy, striae distensae are caused by steroids that inhibit keratinocytes and fibroblasts proliferation (2,5). Glucocorticosteroids inhibit synthesis of collagen, elastin, basal matrix and glukozoaminoglycans (2).

Oikarinen et al. (8) investigated the effects of topical betamethasone-17-valerate on collagen propeptide levels, collagen mRNA level, lysyl oxidase mRNA and matrix metalloproteinase (MMP)-1 and MMP-2 mRNA levels in human skin. Their results indicate that the decrease in collagen synthesis after topical glucocorticoid treatment is due to decrease in mRNA of lysyl oxidase. Lysyl oxidase is an important enzyme catalyzing the cross-linking of collagen chains (8). The study provides a solid molecular basis for glucocorticoid-induced dermal atrophy (7,8).

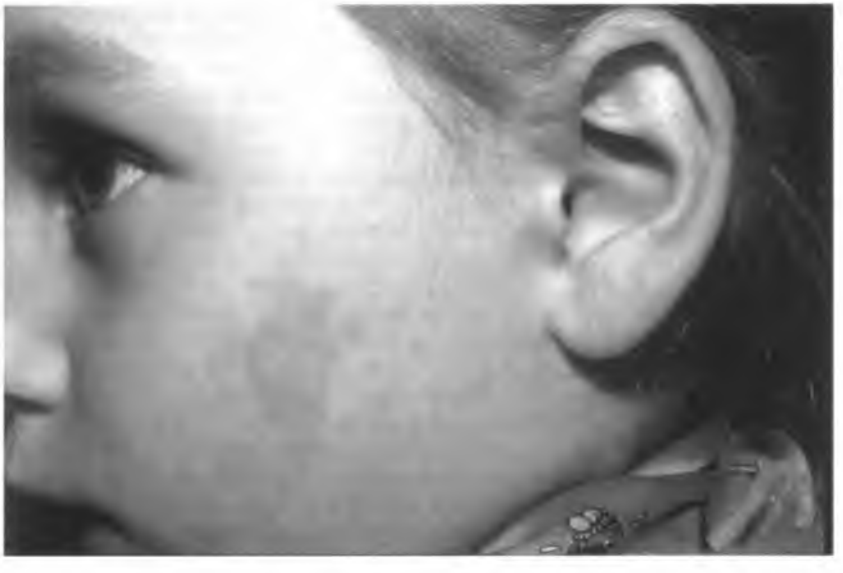
The influence of glucocorticosteroids on epidermal cells is reversible, while dermal alterations are usually irreversible (5). The destruction of many structures, inclusive of capillary vessels, is usually in the stadium in which recovery is impossible (2).

Neittaanmaki et al. (6) reported a case of eyelid skin atrophy caused by long-term application of topical ophthalmic corticosteroids for chronic uveitis. Skin punch biopsy of the eyelid in the uveitis cases showed moderate atrophy of both epidermis and dermis (compared to normal skin of the other eyelid) resulting from a reduction in the three main fibrous components of the skin, namely type I and type III collagens, and elastic fibres (7).

The hirsutism, hyperchromatism, hypochromatism and post-steroids acne were reported (10).

CASE REPORT

A 3-year-old, normally developed girl assisted by her parents was admitted to the outpatients' clinic. The child was born on time; there were no infectious diseases and other complications during pregnancy. The child developed normally, was vaccinated according to vaccination schedule, there were no infectious diseases of childhood in anamnesis. There were no symptoms of atopic dermatitis, either. According to the parents' relation on the cheek skin an elevated lesion 1.0 cm in diameter with the presence of a small amount of non-purulent fluid occurred. There was coincidence neither with insects' bites nor a contact with animals. The physician, who had probably suspected fungal etiology, recommended application of steroid preparation with antimycotic components. For about 3 months the girl was treated with ointments with steroid preparation because of cheek lesions. Different steroid ointments were used containing bethamethasone dipropionate with gentamycine sulfate; another ointment contained natamycine, hydrocortisone and neomycine sulfate and then econazole with triamcinolone acetonide. There was no regression, and the therapy was continued of persisten red inflamed border around the lesion. The unsatisfied parents decided to change the physician. During the examination two areas of 1.2 and 0.4 cm with peripheral hyperpigmentation border width of about 10 mm were detected. On the adjacent area there was a strand of hair longer and darker than the hair on the cheek skin. There was no itching of the change.



DISCUSSION

This is not to say that the topical glucocorticoids are panacea for all skin diseases, but perhaps they may be regarded as the most effective single class of drug providing such broad-spectrum therapeutic benefit (1). The duration of application of steroid drug on the skin surface should depend on its strength (2).

The corticosteroids preparation should be prescribed for children cautiously, because of changes in the anatomical structure and function of children's skin (10). In children thin and poorly developed, epidermis and looser connections between epidermis and dermis make absorption of external substances easier (10). The thermoregulation, absorption and protection functions are changing with age and develop especially during the first two years of life (10).The thicker horny layer, the better developed elastic fibres and the higher number of collagen fibres occur around 3 years, causing increase of resistance and protection of the skin. With great caution steroids should be applied on facial skin, especially in the eye area. When the steroids absorption from hand skin is regarded as one unit, such a factor of absorption from mandibula skin is 13.0 (4). It should be also considered that steroids penetration by the inflammed skin, especially skin without epidermis, is much higher (10).

Steroid hormones have a wide range of activity. Anti-inflammatory effect is achieved through interaction with receptor, thus for synthetic glucocorticosteroids it is of importance to bind mainly the glucocorticosteroids receptor and have low affinity to other steroid receptors. The higher selectivity of synthetic steroids to glucocorticosteroids receptors decreases the number of side effects like hirsutism, acne, hyperpigmentation caused by stimulation of androgens, estrogens and progesterone receptors (4). We believe that in the presented case the safety of this young patient was not considered carefully enough. An ointment with betametazon dipropionian 0.5 mg and gentamycin sulphate 1mg was used. According to the producer's information, there are strict contraindications for this drug administration – hypersensitivity to corticosteroids, gentamycin or basis components. These warnings concern application on face skin and administration in children under the age of 12. Pregnant and breast-feeding mothers should not apply the drug. The time of treatment should be no longer than 2 weeks. In the reported case an ointment with bethamethasone dipropionate with gentamycine sulfate was applied on the face skin in a child 3 years of age, which preceded the application of other steroids. Because of erythema around the treated area steroid was still used, which did not lead to recovery and was unsatisfactory for the parents.

It is of great importance to follow the principles of pharmacotherapy during steroid application. The proper use based on our knowledge determines the final effect of treatment (2). For the treatment especially of infants and younger children under 2 years of age the application of suspension, aerosol and gels that act superficially should be preferred. The creams that are better absorbed should be applied in younger children carefully and ointments only in older children (10). The crucial principle for a physician who uses the drug is expected effectiveness of treatment. Thus, it is more often recommended to use a stronger preparation (e.g. group I or II) in the first period of treatment and to start application of less potent drug when the recovery is achieved. In another mode of application the stronger drug is used once a week, while the weaker one on the other days (4). The steroid preparations cannot be used more often than twice a day, for some of them application once a day for no longer than 3–4 days is sufficient, in particular in infants and younger children. When the therapy should be continued for several days interuptions are recommended (10).

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SUMMARY

A case of a 3-year-old girl, with lesions of the cheek skin, treated with a series of topically applied steroid ointments was described. There were treatment complications, including atrophy, erythematous macules and hirsutism.

Miejscowy zanik skóry policzka i nadmierne owłosienie u 3-letniego dziecka po leczeniu kortykosterydami

Opisano przypadek 3-letniej dziewczynki ze zmianami chorobowymi skóry policzka, leczonej za pomocą serii miejscowo stosowanych maści sterydowych. Obserwowano wystąpienie powikłań na skórze leczonej tymi preparatami. Były to zanik, plamy rumieniowe z przekrwienia, nadmierne owłosienie.