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Review Article

Differences of Perioral Dermatitis in Children

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Abstract

Perioral dermatitis is a chronic facial dermatosis characterized by small papules and pustules on a red, sometimes scaled skin typically affected area of nasobuccal sulci and a of a chin, with sparing a narrow area round lips. It can be manifested also perinasal and at lateral parts of both eyes. Subjective symptoms include tingling and burning, pruritus is rare. Causative agents at children are most often overusage of tooth-pastes with fluor, various emollients and local corticoids. For healing an elimination of causative agents and local treatments are necessary. Peroral treatment with children is used only exceptionally. Less severe forms of perioral dermatitis can be treated by a general practitioner as far as this physician has a good knowledge of this diagnosis. More severe forms have to be treated by a dermatologist.

Keywords: *Perioral Dermatitis; Children; Symptoms; Causative Agents; Therapy*

Introduction

Perioral dermatitis (POD) (syn. a flight attendant's disease).

Definition: Perioral dermatitis (POD) (syn. Lethal disease) is an inflammatory skin disease of the face mostly with a chronic course. It is characterized by small papules and pustules on reddish and sometimes scaly skin. It typically affects the area of the nasal grooves and chin, omitting the narrow area around the lips. Manifestations can also be perinasally and laterally from both eyes. Subjective symptoms include stinging and burning, itching is rare.

History: The term perioral dermatitis was first used by Mihan and Ayres in 1964 [1], but cases with similar clinical features have been described previously. They affected adults and the main cause was the use of local corticoids on the face. The first five cases in children were described in 1970 by Gianotti et al. [2], followed by references of other case reports and files. In most of these cases in children, the use of fluorinated corticoids was the trigger. Gianotti et al. published as the first and granulomatous variant of perioral dermatitis in children [2].

Epidemiology: POD mainly affects women aged 15-45, but increasingly also children of all ages. It is less common in men. The granulomatous variant POD is much more common in racially pigmented children, but the reasons are unknown [3].

Pathogenesis: The exact cause of the disease is not yet known. A combination of genetic predisposition, environmental influences and responses to various stimuli is assumed. It is associated with an epidermal barrier disorder, activation of the innate immune system, disrupted cutaneous microflora and the presence of follicular fusiform bacteria. According to some authors, excessive hydration of the stratum corneum epidermis caused by the application of moisturizing creams or, conversely, occlusive ointments is important for the formation of POD. Skin intolerance may also play a role (atopy, constitutionally dry skin, use of drying externals, eg benzoyl peroxide, tretinoin, topical alcohol preparations, etc.). The microbiological causal cause has not yet been established. However, the possibility of associated yeast and bacterial infection as well as the possibility of using the Demodex folliculorum mite is assumed. [4]. In young children, the role of Demodex is problematic because they do not yet have fully developed sebaceous glands. The presence of fragments of Bacillus oleronius was also proved by PCR.

POD may in dust the following causes

- **Medications:** Topical steroids exist clear correlation between the risk of developing POD and the power or duration of use of the topical steroid. POD may occur even after nasal, inhalation or oral use of corticosteroids. The long-term use of pimecrolimus and especially tacrolimus may also be a cause. The development of POD after taking fluoride tablets cannot also be excluded.

- **Cosmetics:** Fluorinated toothpastes, ointments and creams intended for skin care, in particular with a vaseline or paraffin base. These are increasingly used by mothers in children in an effort to improve the condition of the skin and improve the quality of teeth. In children, both POD and physical sunscreens may be the cause. Other possible causes are dental fillings, chewing gum, perfumed handkerchiefs and neglect of face washing.

- **Physical factors:** POD aggravates UV radiation, heat and wind. The mechanical cause may be friction in adolescents caused by contact with the partner‘s beard, nail biting in young children.

- **Microbial factors:** Fusiform spirilla bacteria, *Candida* species and other fungi have been isolated from POD deposits.

- **Other:** Due to the observed premenstrual deterioration, the proportion of hormonal factors is also assumed. Oral contraceptives and pregnancy may also be the cause. POD often occurs in patients with Crohn‘s disease and myasthenia gravis. Some causes can be combined.

Clinical picture POD: The characteristic features of pod are:

- One-sided or double-sided eruption on the chin, upper lip and eyelids in perioral, perinasal and periocular distribution

- Perioral fade, not affected area around the nasal entrances and on the eyelids

- Clusters of 1 - 2 mm large pink papules to papulopustules

- Dry skin surface

- Burning of the skin.

On the skin you can see follicular arranged small reddish papules, papulovesicles to papulopustules on a reddish substrate with a tendency to coincide (Figure 1-3). Papules and pustules have primarily perioral distribution. Other affected areas may be nasolabial grooves and the area laterally from the eyes and under the lower eyelids of the lower eyelids. Children are more likely to spread to perinasal and periorbital areas [2]. Young women are 20% more likely to have disabilities other than perioral localisation. In general, only in the most severe cases can the lesions spread to the cheeks up to the whole face. Comedones and telangiectasia are not a sign of disease. POD is not accompanied by increased mazoflow. Skin changes are not a symptom of systemic disease. An extreme variant of the disease is called granulomatous POD, where granulomatous infiltrates glow yellow during diascopy. Lesions merge into well-defined areas bounded by nasolabial grooves and chin [3].

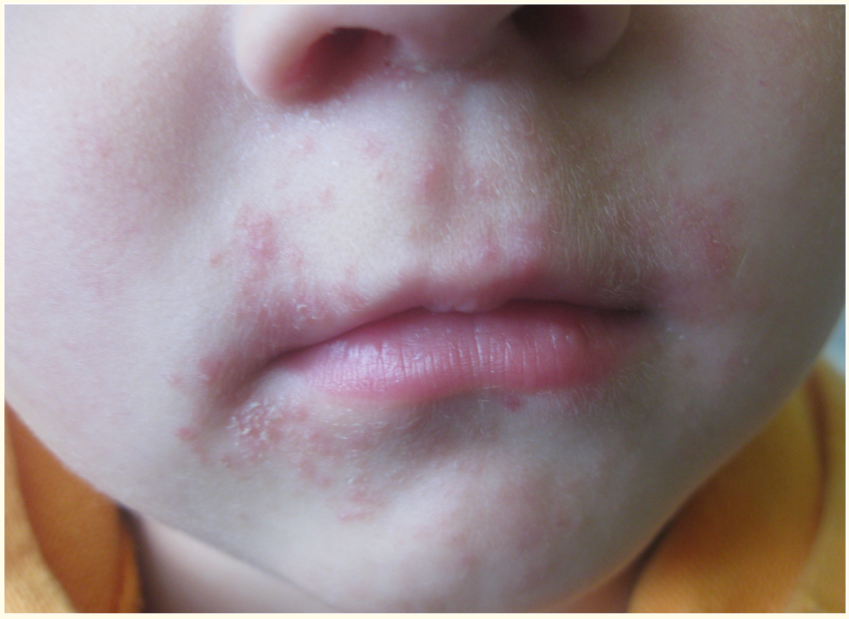

Figure 1

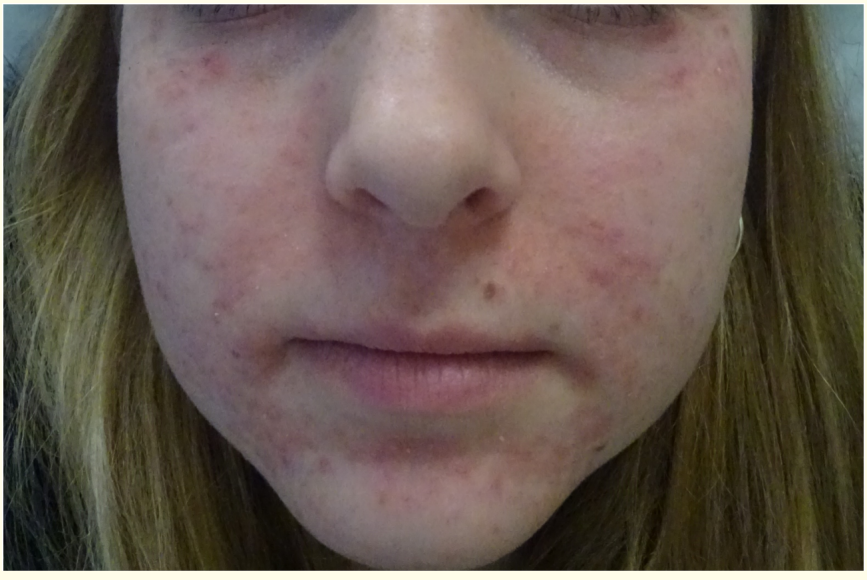

Figure 2

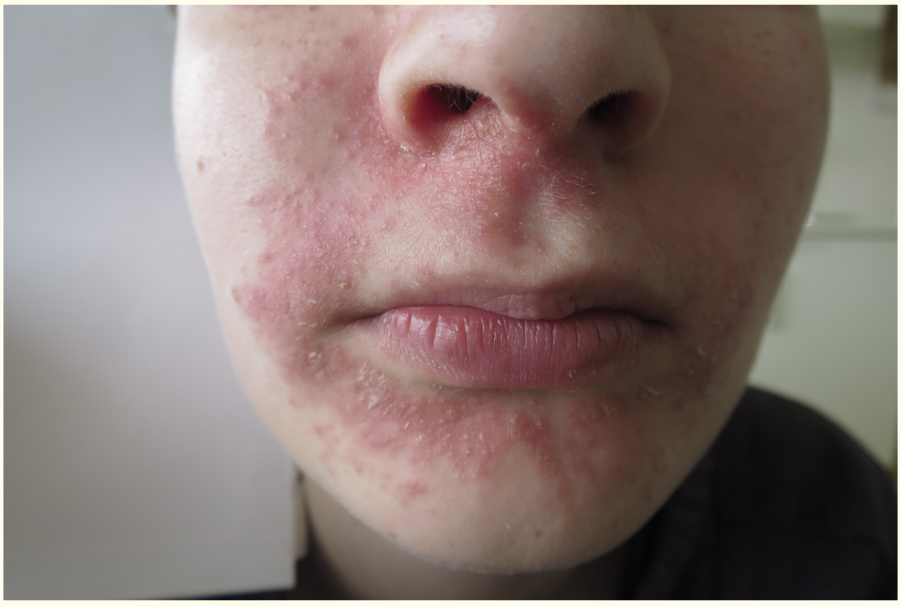

Figure 3

Perioral dermatitis severity index (PODSI): To quantify objective findings and symptoms in POD, Munich authors Wollenberg and Oppel Perioral Dermatitis Severity Index (PODSI) [4] were created and published in2005. Erythema, papules and peeling are evaluated. All 3 parameters can have a score of 0-3. PODSI is the sum of individual scores for erythema, papules and scaling. According to the total of each score, the degree (grade) of the POD is determined. Grade 0 is POD free, grade 0.5 - 2.5 means subtle POD, grade 3.0 - 5.5 moderate POD, and grade 6.0 - 9.0 severe POD. The score is described in more detail in table 1. PODSI evaluation is the simplest means of determining severity, monitoring clinical progress and evaluating the treatment effect of each patient. It is fast and simple and can therefore be easily used in everyday practice.

Degree	1	2	3
Erythema (color)	Pink	Reddish	Dark red
Papule	Small, small	Several	Numerous
Peeling	Mild, gentle	Distinct	Significant

Table 1: *PODSI determination (adjusted according to 4).*

May be used interstage 0.5, 1.5 and 2.5.

Rating: Grade 0 is POD-free, 0.5 - 2.5: subtle POD, 3.0 - 5.5, moderate POD and 6.0 - 9.0 severe POD.

Laboratory and histological examination: The diagnosis of POD is determined on the basis of a clinical picture. Normally no laboratory sampling and testing should be carried out. In case of suspected associated bacterial or fungal infection, a swad can be carried out for microscopic and culture examination. *Demodex* can be demonstrated by examining the follicle content (after scraping) in the lye preparation. Lymphohistiocytic infiltrate in perifollicular and perivascular localization is present at all stages of POD. If pustules and papules are the dominant clinical findings, granulomatous inflammation is evident and periphery abscess may occasionally be present.

Differential diagnosis: Differentially diagnostically, acne, demodicosis, seborrheic dermatitis and atopic eczema should be distinguished in children. Acne vulgaris is characterized by oily skin and the presence of comedones. In demodicosis (infection caused by *Demodex folliculorum*) follicular bound papules and pustules are found localization is rather only one-sided. Atopic dermatitis is present also on other parts of the body, usually atopic diathesis is positive. In seborrheic dermatitis, greasy scales are present. It is important to differentiate POD and periocular contact allergic or irritative dermatitis (especially on the eyelids and around the eyelids). Manifestations of POD and dermatitis can also be combined. In addition, clinical symptoms of both periorbital and perioral dermatitis may also be induced by certain external factors or local medicines (corticoids, rarely local immunomodulators, especially tacrolimus) applied to other underlying diseases such as atopic or seborrheic dermatitis. In differential diagnosis, it is also necessary to think about acrodermatitis enteropathica (manifestations are also found elsewhere on the body, there is low zinc levels in the laboratory) and Haber syndrome, or rosacea-like dermatitis. It is rare a genodermatosis, which begins in childhood. It is also an intraepidermal epithelioma, keratotic plaques and scars are typical. Differential diagnosis of granulomatous forms includes rosacea, sarcoidosis, benign cephalic histiocytosis, lupus miliaris disseminatus faciei and granulosis rubra nasi.

Treatment with POD: Treatment of less severe forms is possible with a pediatrician, if these are familiar with this diagnosis. Treatment of severe forms always belongs to the hands of a dermatologist. There are a number of recommendations for the treatment of POD (5, 6 and others), this text exploits the JDDG recommendations of 2011 [7] and the information presented by Reichenberg in 2015 [8]. Table 2 shows a summary of treatment measures for children, subtle cases, pregnant and breastfeeding women, as well as a procedure for dealing with serious forms of POD. Severe conditions are unlikely in children and adolescents. If they occur, they must be dealt very individually by a dermatologist. After the healing of pod POD symptoms, subsequent maintenance treatment is appropriate in children in more severe forms, for which azelaic acid or adapalene is most suitable.

Children, subtle cases, pregnant and breastfeeding women	• Zero treatment, elimination of provocative factors, elimination of ointments • Indifferent pastes • Antimicrobial medicines (e.g. metronidazole, ivermectin, erythromycin) • Pimecrolimus cream off label • Adapalene or azelaic acid
Severe forms	• All measures see above + systemic treatment: • In children: oral erythromycin in adolescents doxycycline, metronidazole or azithromycin exceptionally • In inadequate and granulomatous forms- oral isotretinoin

Table 2: *Summary of treatment measures for perioral dermatitis.*

Individual treatment measures with POD treatment products

Zero-therapy is based on the idea that by eliminating all local drugs and cosmetics, the causal factor POD will also be excluded. This form of treatment is suitable in very complicated patients. It can be especially effective in cases associated with steroid use, where intolerance to cosmetics is assumed.

Topical treatment: In children, it is advisable not to recommend in different soft pastes or micronized talek, zinc and TiO_2 in a suitable ossuary base. It is only when not improving that it is possible to try other preparations. It is always necessary to take into account the age from which the medicine can be taken. Metronidazole (antiparasitic) is taken with 0.75% gel or 1% cream twice a day, preferably for the night in the form of a paste. Local metronidazole is one of the safe and effective drugs, it is suitable for any form of POD. Ivermectin in the cream is a drug approved for the treatment of papulopustules form of rosacea. For its antiparasitic effect (reduces the number of Demodex folliculorum mites) and the anti-inflammatory effect can also be expected in POD. It is advisable to take it lx daily for the night, ideally (depending on the initial severity of the condition) for at least a few weeks after the disappearance of the papule (personal observation). Sulfur preparations (backing, with larger buns can be carefully even paste) are tolerated very well 2 times a day. Erythromycin at a concentration of 2 - 4% is now unavailable in the Czech Republic as HVLP, it is possible to prepare a magistral liter to a suitable base (cream, lotion). It is taken twice a day for up to 3 months. Local immunomodulators (offlabel pimecrolimus 1%cream, to pay the patient) should be applied twice a day, it is suitable especially for corticosteroids induced by POD [9]. It is very well tolerated by children and the effect usually takes place quickly. Watch out! Tacrolimus 0.03% is produced only in ointment, its occlusive-acting ointment base can increase the risk of developing POD, so this is therefore not suitable especially in children for POD treatment. Dapalin [10] can be used for re-treatment or maintenance treatment with prolonged POD, especially in acne-related overlaps with good effect. The cream should be applied very carefully only after the acute manifestations have calmed down, at first on a small area and for a short time, later with good tolerance it is possible to increase the area and application time. Azelaic acid (in the Czech Republic 20%in cream) should be administered1-2 times a day according to tolerance. It induces bacterial resistance and is well tolerated [11]. Exceptionally, it is possible to use local antifungals in a suitable basis (most often with a combination of POD and seborrheic dermatitis). Clotrimazole in the form of a good cryo paste is a skin manifestation of y, and thus positively affects the psyche in adolescents. In these it is possible to use 2% ichthyol in soft zinc paste. With initial deterioration after previous long-term use of strong local corticosteroids, treatment may exceptionally be started by slowly „discontinuing“ steroids with small doses of 0.1 - 0.5% hydrocortisone cream to prevent significant deterioration. Otherwise, patients are at risk of returning to the originally used strong local corticosteroids [12]. Otherwise, local corticosteroids are contraindicated in POD.

Systemic treatment is used in children quite exceptionally in very serious conditions. It should always be guided by a dermatologist. Antibiotics, anti-parasitics, exceptionally retinoids or corticosteroids may be used. Again, the age limit should be taken into account, from which the drug can be recommended. Z and antibiotics are supposed to be the first choice of erythromycin in children, but it is not currently available in the Czech Republic. Otherwise, tetracycline-like antibiotics, especially doxycycline, work best, and tetracycline can also be used in a tailored dose. In children, however, it is contraindicated for storage in teeth and bones. Minocycline is currently not available in the Czech Republic. Of the macrolide antibiotics, it is also possible to take azithromycin in pulse regimen for 1 - 2 months. With intolerance or contraindications of cyclins i clarithromycin 250 to 500 mg twice a day for 1-2 months. Metronidazole (antiparasitic) is an imidazole antibiotic effective against various anaerobic bacteria and protozoa, it also has an anti-inflammatory and antioxidant effect. Reduces the number of papulopustules and reduces redness. It is used orally in different modes, the continuous application is recommended only with great caution. Isotretinoin (retinoid) is indicated for the treatment of long-lasting and refractory cases and granulomatous forms of POD. Corticosteroids maybe used and exceptionally in severely inflammatory and torpid states in short-term pulse therapy.

Pod progress and forecast: The duration of POD is different, in children it tends to be rather short-term (weeks, months) compared to adults. Care includes initial education of parents (possibly also the patient), including the choice of appropriate treatment, regular checks on compliance with therapeutic and preventive measures and evaluation of the effect of therapy. Reassuring parents (patients) and instructed them consistently on possible provocative factors and accurate explanations of treatment are very important. It is necessary to explain the prohibition of the use of local cosmetics and all other preparations except prescribed ones. Although POD is limited to the skin and does not endanger life, it can cause emotional difficulties for facial impairment, especially in adolescents. The disease can relapse. If provocative factors are obvious, then they should be excluded in the long term. These measures minimise the possibility of relapse of the disease. In general, it is possible to prevent the development of POD by skipping the use of topical corticosteroids on the face and omitting treatment with occlusive face creams. The use of opal corticosteroids on the face is generally contraindicated. If their use is necessary, they should only be applied to the affected area, the least potent type, preferably not daily, and treatment should be discontinued immediately after exacerbation [13].

Conclusion

Perioral dermatitis can also be used in children and adolescents. The number of people affected is increasing mainly due to the overuse of fluorine toothpaste and excessive care for children‘s skin. For healing, removal of inducing factors and local, quite exceptionally systemic treatment are required. To prevent relapses, long-term exclusion of known provocative factors and sometimes subsequent maintenance treatment is required. Only by combining all these measures can lead to an improvement in the healing of all symptoms of perioral dermatitis.

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