

Protecting the skin barrier – fungal infections and skin care

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Pharmacy offers a multitude of highly efficient active agents for the treatment of fungal infections. Experience however has shown that without appropriate skin care the symptoms soon reappear after the antimycotic medication has been stopped.

Fungal spores are omnipresent. Public facilities such as swimming pools, saunas, whirlpools, locker rooms and sports halls, but also hotels with their carpeted floors and their spas offer ideal conditions for the spread of fungal infections. Flip-flops offer a certain protection but cannot avoid the inevitable swellings of the skin that occur in bathing areas. Things even get worse after the bathing unless the areas between the toes are carefully dried. When the skin is swollen, it also becomes more permeable. In the case of skin barrier damages, the pathogens then have an easy job of it. They have unrestricted access into the skin and will find abundant substrate in the form of skin fragments. The starting conditions for fungal infections are perfect though.

Moderate skin cleansing recommended

Damages of the skin barrier frequently are pre-programmed due to a misinterpreted, or, in other words, excess hygiene behavior. Vital barrier substances such as ceramides, fatty acids and cholesterol are dissolved and washed out of the skin. Subsequently applied creams with emulsifiers cannot compensate the losses. Even worse: they frequently support the wash out process during the next cleansing of the skin.

The damp environment of the areas between the toes, the armpits and in the genital area due to the clothing and the correlated swellings of the skin complement each other which altogether is an ideal breeding ground for fungi.

Foot mycoses

Foot mycoses are caused by dermatophytes. The hyphomycetes (filamentous fungi) infiltrate the skin barrier and visibly raise individual skin layers. Itching and redness develop. Depending on the degree of the attack and miscellaneous infestation, the following antimycotic medication is administered:

- imidazole derivatives such as bifonazole, clotrimazole, econazole, isconazole, ketoconazole, miconazole,
- triazole derivatives such as fluconazole, itraconazole,
- allylamine derivatives such as terbinafine,
- morpholine derivatives such as amorolfine.

Most of the medical drugs inhibit the ergosterol synthesis in the cell membranes of the fungi. In general, the drugs have to be administered for extended periods of time. In the meantime, it has to be ensured that the skin barrier can optimally recover. By combining the substances with other antibacterial and fungicide additives such as benzyl alcohol, it is attempted to improve the efficacy and shorten the treatment. Some of the active agents can be used topically as well as systemically but also in the treatment of other mycoses. In particular cases, also macrolide polyene antimycotics such as nystatin, natamycin and amphotericin B are applied.

Candida infections & Co

Besides the dermatophytes, also other pathogens as for instance candida (yeast fungi) or aspergillus types (mildew) can infest the skin. Mycoses that simultaneously are accompanied by bacterial secondary infections pose a problem though.

Disinfecting agents have become outdated today, however, in comparison with oral antimycotics, they frequently are the better alternative when treating extended skin areas and particularly in the treatment of children since they involve less systemic strain for the body. Gentian violet (crystal violet) is one of these substances that are also effective in the case of complex dermal infections accompanied by a candida infestation. The active agent has a disadvantage though: it stains clothes.

A weakened immune system encourages aggressive candida types. Characteristic symptoms are planar, intensely reddened skin le-

sions that for instance develop on the inner surface of the thighs.

This specific type of fungi infections often involve the problem that the pathogen cannot be identified without long-term fungus cultures. Frequently the infection is accompanied by additional symptoms. This even can lead to the fact that in the case of secondary infections the fungus infection is overlooked. Infections with candida albicans are called candidoses and also develop on the mucous membranes in the mouth (“thrush”) and in the vagina.

Nail fungus

A particularly embarrassing variant is nail fungus. In this case, dermatophytes infiltrate the bed of the nail and cause a complete destruction of the nail. Due to its particular features, the treatment of nail fungus is very complicated and the symptoms also are a visible cosmetic problem. The therapy either is systemic which actually takes quite some time, or alternatively consists of removing the damaged nail with a 40% urea solution within a week in order to start a topical treatment.

The external application of antimycotic, water soluble enamels (about 8% ciclopirox or amorolfine) only can be recommended for minor damages and also takes its time. Before the individual treatments, it is significant to file the nail or respectively treat it with a cutter to ensure an optimal penetration of the enamel solution. Sometimes topical and systemic preparations (terbafine, fluconazole, itraconazole) are simultaneously administered.

The efficacy of alternative laser treatments is controversially discussed among experts. During this kind of treatment, the infected areas are heated up to 60°C in order to denaturize the fungus proteins; although at least 80°C are required in order to kill the persistent fungus spores.

Dandruff

Scaling of the scalp frequently is caused by Malassezia yeast fungi. The fungi subsist on the superficial lipid substances discharged from the sebaceous glands and release the fatty acids. Hence the infection frequently is based on a seborrhoe. The sweat glands additionally provide a damp environment. In case that the scalp skin barrier also is disturbed by combing, itching and frequent hair washing with aggressive tensides, the infection will continue to spread. The medical treatment includes shampoos, lotions or creams that, besides the above mentioned antimycotics, can contain derivatives of 2-pyridone such as ciclopirox, pirocton olamine, pyrithione and

keratolytic active agents such as salicylic acid and urea or sebum suppressive substances.

In terms of a preventive cosmetic care, the following suggestions can be beneficial:

- Reduce the application of aggressive shampoos - if possible (!). It already often improves the seborrhoeic condition. The tenseness and irritations of the scalp will decrease.
- Wear a carefree, short hairstyle.
- Apply cosmetic active agents on a non-greasy liposomal or nanoparticulate base with the following components: urea (anti-itching), linoleic acid (anti-inflammatory; substrate for ceramide I) in the form of phosphatidylcholine (carrier), vitamin A derivatives (skin recovery) and D-panthenol (skin recovery).
- Cosmetic creams based on derma membrane structure can improve the barrier function. Prerequisite here is a very short haircut though.

Pityriasis versicolor

Related with dandruff are the symptoms of pityriasis versicolor. It also is an issue of superficial infections developing on the sebum-rich skin areas of the body. It is caused by malassezia yeast fungi that belong to the natural skin flora of the human body. The treatment of the scaling and slightly raised areas is similar to the methods described for dandruff, among others also with selenium disulfide containing cleansing agents. The infected areas turn brighter after sun exposure since the melanin production is reduced in these parts. Vice versa, the areas appear slightly darker on pale skin. Frequently affected are young people with a particularly pronounced sebum production.

Vaginal mycoses

If the acidic milieu (pH 4 up to 4.4) of the vagina is disturbed, candida infections can develop. These infections frequently appear during pregnancy. The fungus can be transferred to the newly born child during birth and then often develops in the form of thrush (see above). Similar to pregnancies, also estrogens and contraceptive drugs encourage this type of infections since they modify the vaginal milieu on the one hand; but also because of the estrogen receptors of the fungi.

Just like other fungus infections, also vaginal mycoses will appear in the context of a medication with immune suppressive drugs, antibiotics and glucocorticoids. They are treated with

vaginal creams or tablets both containing the above mentioned active agents. From the cosmetic point of view, only mild cleansing agents as for instance mild sugar tensides should be used. It is additionally recommended to apply them only in the vulvar area and not too frequently. Lukewarm water without any additives can be an alternative here. Excess hygiene disturbs the natural vaginal flora.

Unless the medical ointments and lotions used in the antimycotic medication already contain skin recovering substances, the cosmetic measures can be based on the same active

agents as administered for the cosmetic dandruff treatment. Recommended are vitamin creams formulated with a derma membrane structure base to be applied daily alternating with the antimycotics after a first recovery has been observed. In particular, persistent foot mycoses which tend to develop relapses should be treated with vitamin creams containing the vitamins A, C, E and D-panthenol. As a preventive measure, it is recommended to repeat the treatment.

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