

# **SCABIES**

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## **Introduction**

Scabies is a worldwide spread itchy dermatosis caused by the mite *Sarcoptes scabiei variatio hominis*, in English itch mite. It is mistakenly considered as a rarely appearing disease. Even today it is a common disease in every day dermatological practice and it even occupies the first place among professional dermatoses in the Czech Republic!

## **History**

The first references of the disease appear in the Bible (1000 BC). The disease was first described by the precise observer Hippocrates and the name is derived from the word scratch, scabo in latin, which describes the behaviour of the affected.

## **Cause**

*Sarcoptes scabiei variatio hominis* is a mite of the order Acarina, suborder Astigmata, family Sarcoptidae. An adult female (picture 1,2) is 0.3 – 0.4 mm big, of oval shape with brown mouthparts and four limbs, sometimes visible with a magnifying glass. The male is smaller, 0.16 – 0.2 mm, it does not burrow tunnels and it lives just on the surface of the skin. After copulation it dies within 48 hours. The itch mite can live and reproduce only on humans. The fertile female moves on the skin at a speed of about 2.5 cm/min and in 30 minutes it starts to burrow a tunnel where, in 3 – 20 minutes, it hides completely. The tunnel heads first vertically from the skin surface, in stratum granulosum it turns and continues in this new level paralelly with the skin surface. The female that never leaves the original tuunel burrows about 0.5 – 5 mm a night and lays 1 – 3 eggs during a day. It lives for 4 – 6 weeks and during its life it lays approximately 50 eggs. The number of itch mites in an affected person is 10 – 20 in case of common scabies, however, in case of Scabies norwegica there are millions of them.

## **Epidemiological data**

The morbidity of scabies worldwide is obviously quite realistically estimated as 300 millions. In developing countries it affects over 20 % of people ill with a skin disease and for example in Japan it is 1.96 %. The occurrence increases in relation to the migration of people, during armed conflicts and natural disasters. It is the migration of people that caused the actual increase in the occurrence of the disease in the Czech Republic. The scabies incidence increased before WWII, during which it reached the climax (15 %), in the 1950s scabies became very rare and in the 60s it spread again. The last epidemic ended in Czechoslovakia in 1974, the climax being from 1968 to 1970 with the incidence of 400 people per 100 000 inhabitants. Since 1991 another growth has been observed. Cyclic increases of the incidence seen worldwide with a wave development of the epidemics in intervals of about 15 years with a maximum every 30 years are not just a reflection of social and hygienic conditions, their cause stays unclear.

Scabies is the fourth most common infectious disease in the Czech Republic. All age groups are affected; the biggest incidence is in 15 – 19 year-olds. The last scabies epidemic was in 1994. At present, according to the predictions, another epidemic is expected here.

## **Transmission**

The transmission is caused by a direct contact with the ill by means of fertilized mite females; especially in overcrowded places, places with a higher rate of poverty, bad hygiene and more frequent in certain jobs like e.g. nursing. The transmission is possible also by a sexual intercourse and that is why the disease in the dermatological nomenclature ranks among the so-called sexually transmitted diseases. – so-called STD.

The transmission is also possible indirectly – via underwear and bed linen, a tonometer or a short body contact, this type of transmission is observed above all in *Scabies norwegica*. The epidemic can also be caused just by one fertilized female.

## **Clinical picture**

In 2 – 6 weeks after the transmission the disease manifests by intensive itching mainly at night, typically after lying down to bed. It is when the female starts burrowing its tunnels irritating free nerve endings. In predilection locations (picture 3), that is places with a thinner stratum corneum layer such as interdigital areas on hands and feet, elbows, wrists, anterior axillary folds, areolae or penis, we can notice the presence of pathognomonic symptoms, i.e. s-shaped tunnels, 0.5 -1.5 cm long. At the end of a tunnel there is a dark spot visible to the naked eye which is the itch mite (picture 4). Impetiginization and eczematization of the areas is typical for scabies, which can lead to a really varied picture including erythematous macules forming, excoriation, vesicles and papulopustules or even vast suppurative areas with crusts, this large pyoderma can lead to sepsis or creation of glomerulonephrosis. In case of high hygiene, people often having showers, the scabies diagnosis is difficult (so-called Scabies of the “washed”) as just few sporadic symptoms mainly papules can be seen, and the main symptom is usually intensive night pruritus. The symptomatology can be considerably suppressed by total or local treatment by corticoids (*Scabies incognito*).

*Scabies nodularis* appears in about 7 % of the affected. The papules and nodules are strongly itching, up to 10 mm in diameter, brightly red to brownish that sometimes relapse even many months after the treatment.

*Scabies norwegica* (syn. *crustosa*, *hyperceratolica*) is a rare form of scabies affecting above all immunosuppressed patients, individuals with decreased susceptibility to pruritus and mentally retarded people. It is extremely infectious, given the big amount of parasites on the skin of the ill – up to 2 millions on one patient. From the clinical point of view there are generalized erythematous squamous papules and strong hyperkeratotic layers with crusts and chapped skin in the area of increased pressure, above all over the limb extensors (arms, legs, buttocks, elbows, over finger joints etc.).

## **Diagnosis**

Making a diagnosis is based on the anamnesis and aspection. The patient complains about evening and night pruritus of nearly agonizing character. We look for s-shape tunnels on the skin and couples of papules at their mouth.

In case of diagnosis doubts it is recommendable to prove the incidence by a microscopic examination of peeled-off skin in 10 % KOH solution or follow old dermatologists' advice and apply a treatment just to be sure.

## **Animal scabies**

Different varieties of *Sarcoptes scabiei* infest animals as well (horses, cattle, dogs, pigs, goats, sheep, camels), however, apart from its specific host they are unable of reproduction and infestation. Animal itch mites are not able to burrow tunnels in humans; they just cause individual itching pustules. The transmission is possible only by close contact with an affected animal, where erosion, crusts and areas of fallen-out hair can be seen. The symptoms heal spontaneously after breaking the contact with the ill animal.

## **Epidemiological precaution**

1. the main principle is always to treat the whole family, even if the disease still does not manifest on the family members!
2. anamnesticly find all the relatives as well as other people staying in the flat of the affected person and apply a thorough treatment.
3. clothes and linen must be boiled – the itch mite dies when exposed to 50°C
4. steam the carpets and sofas or take them outside.
5. utmost solution – leave the flat for 3 days as itch mites can survive away from the skin just for 3 days.

## **Therapy**

At present the most effective medicine for scabies worldwide is permethrin. The earlier used lindane (Jacutin, Skabicid) is nowadays forbidden in the whole European Union. Another possibility is the sulphur ointment therapy, which is, due to the unclear toxicity of sulphur, considered to be obsolete. For instance in the USA and Germany the sulphur ointment is not recommended for curing scabies at all.

Permethrin is recommended by WHO as a medicine of choice in the scabies therapy and is used in most countries in the world. It has an excellent safety profile, it practically does not absorb and that is why it can be used in children from 6 months old, pregnant and breast-feeding women. When applying no part of the body should be omitted and permethrin is left to act for at least 8 hours (most frequently during the night). After 8 hours the patient cleans the ointment off, ideally using an antiseptic soap (e.g. Cutosan). Permethrin is non-irritating, without smell, does not stain the linen and is well tolerated by patients. The compliance with patients is thus very good. Its efficacy is very high and reaches 100 % if well applied.

The pharmacological effect lies in repolarization of the nerve cells of parasites which later quickly die of pulmonary arrest.

Regarding the higher need of permethrin because of the higher occurrence of scabies and lice, permethrin was put in the regulation n. 270/2013 Coll. of determination of active substances and excipients which can be used to prepare medicinal products and can be already used in the magistral formula. Permethrin in a form of magistral formula is prepared in pharmacies and is covered by insurance companies. The prescription is as follows:

*Permetrini 5% cream 100.0*

*D.S. apply all over the body for 8 hours, repeat one week later.*

It is necessary to remember that even after a successful treatment of scabies, itching persists for several days more. That is brought about by eczematization of symptoms. This is caused

by the organism reaction to itch mite bodies, their eggs and spores (so-called skybala). All these elements stay in the tunnels of stratum granulosum after the treatment until they are excreted by a skin physiological change. Secondary impetiginization may also appear on the skin brought about by the staphylococcus taking advantage of locus minoris resistance, i.e. skin cover disruption by itch mites, and it reproduces. The eczematization is best healed with emolience (e.g. AD lotio Chronic), more severe conditions externally by means of corticoids, the impetiginization by local antibiotic creams and the pruritus by antihistamines. The follow-up treatment usually takes a week.

The possible exacerbation of the disease is usually caused by an incorrect application of permethrin when a patient does not apply the cream on certain areas on the skin (usually the genital area or between toes). Other cause of the exacerbation is the autoreinfection from detritus under the nail plates of hands. Itch mites get there easily due to patients' intensive scratching. It is then important to warn the patient before the therapy about the necessity of cutting nails short and the mechanical removal of detritus under them.

Note. Permethrin is also used in treating lice where again its efficacy is very high if applied correctly. It is ideal to leave the permethrin emulsion in the hair for 8 hours under a breathable head cover (e.g. cloth, scarf, do not use plastic caps!) After one week the application is repeated in the same way. The prescription for this indication is:

*Permetrini 5% emulsion 100.0*  
*D.S. Rub into wet hair and leave for 8 hours, repeat after one week.*

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#### Bibliography:

1. prof. MUDr. Jiří Štork : Scabies, Česko-slovenská dermatologie (Czecho-slovak dermatology), year 74, february/1999