GIG CYMRU NHS WALES

Bwrdd Iechyd Prifysgol Caerdydd a'r Fro

Cardiff and Vale University Health Board

SCABIES

Questions & Answers

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Contents

Management summary

- For classical scabies:
  - Permethrin 5% cream or malathion 0.5% aqueous liquid. Permethrin is the treatment of choice. Use malathion if permethrin is inappropriate.

- For crusted (hyperkeratotic or Norwegian) scabies:
  - Oral ivermectin (available on named-patient basis) plus topical treatment (e.g. permethrin 5% cream). Mechanical clearance of crusted regions under the nails and keratolytic therapy, e.g. 2% salicylic acid ointment, might be beneficial.

- In pregnancy:
  - Permethrin 5% cream or malathion 0.5% aqueous liquid if permethrin is inappropriate.

- In breastfeeding mothers:
  - Permethrin 5% cream or malathion 0.5% aqueous liquid if permethrin is inappropriate.

- In young children:
  - Permethrin 5% cream (2 months and older).
    or
  - Malathion 0.5% aqueous liquid (6 months and older).

Background

Scabies may be described as a delayed hypersensitivity reaction to the saliva and faeces of the parasitic mite, *Sarcoptes scabei*, which burrows in the skin.

Research into the epidemiology of scabies in the UK has indicated that scabies is more common in winter than in summer[1,2], in urban than rural areas and in children and women than in men.[1,2] There are around 300 million cases of scabies in the world each year.[3] Scabies is not a notifiable condition in the UK.[4]

1. Does scabies present in more than one form?

Scabies may present in a 'classical' or 'crusted' form. **Classical scabies** is found in people with fully functional immune systems, whereas **crusted scabies** usually occurs in patients who are immunocompromised, institutionalised or in those who have become insensitive to itch, perhaps due to long-term scabies.[3,5,6] Crusted scabies is also known as hyperkeratotic scabies or Norwegian scabies. It is extremely rare in its fully developed form.

2. How is classical scabies transmitted and which groups are vulnerable to infection?

Transmission of scabies mites is by direct skin-to-skin contact.[7] Transmission could not be expected to occur during a single, brief handshake, but is more likely to occur following prolonged contact.[8]

Scabies is more likely to spread within close communities and families, but studies have shown the onward transmission rate to be lower than might be expected. In one study, the secondary attack rate within households was 38%.[9] Generally, adults are infected as a result of contact with children and not vice versa.[9] Scabies affects more women than men.[2,7] Sexual partners are commonly infected.[3]

The disease shows a clear bias towards the young.[7] Most at risk are children and teenagers.[2,10] There is also a relatively high incidence amongst the elderly in nursing homes.[5]

3. How is crusted scabies transmitted?

The risk of transmission is greatly increased with crusted scabies. People with this form of scabies develop crusted lesions on their bodies[6] and carry a large burden of mites.[7] Crusts containing hundreds of live mites may break away, perhaps making infection from mites in these crusts possible.[3] Crusted scabies cases can be a major infection control problem in long-stay institutions.[11] This form of scabies is often at the centre of an outbreak of classical scabies among the families or contacts of residents.

4. How many mites does a person with scabies carry?

The number of mites per infected person depends on their immune status.

Initially, immunocompetent people may harbour a large number of mites. Bathing reduces the number of mites significantly and, even a few weeks after infection, levels are likely to be lower than the initial count in most people. Many mites are eliminated during, or as a result of scratching and the number of mites will eventually fall to about 10 in most people.[7]

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People with compromised immunity are more likely to develop crusted scabies and carry hundreds of thousands of mites. Up to 4,700 mites per gram of skin has been counted in skin that has been shed from people with crusted scabies.[3]

5. What is the life cycle of the scabies mite?

Scabies mite eggs are laid in burrows, hatch within 3 to 4 days,[6,12] and go through three juvenile stages before reaching maturity.[8] After eggs are laid, 10-13 days will elapse before the appearance of adult mites.[6] Male scabies mites move on the skin surface,[6] whereas female mites live out their life span of 4-6 weeks in burrows[6,13,14] within the stratum corneum.[7] The female mites begin to lay eggs soon after starting to burrow and continue to lay 1-3 eggs daily.[6,13]

6. What are the symptoms of classical scabies and how quickly do they develop?

People with classical scabies usually experience a delayed hypersensitivity reaction to the mites, their eggs and faeces. They experience intense itching and a transient, ill-defined, bilaterally symmetrical rash; symptoms that take about 2 to 6 weeks to develop.[3,6,15] In the event of reinfestation, symptoms can develop within 1-3 days or longer **(see also Question 20)**.[3,5]

While asymptomatic, people can transmit the mites to others even though they are unaware of having them.[5]

Lesions appear around mite burrows. These can be papular, pustular or excoriated.[5]

Common sites for burrows are:-

- between the fingers
- on the wrists
- the sides of hands and feet
- the outside of the elbow
- the penis and scrotum
- female nipples
- anterior axillary folds.[16]

Although indicative of the presence of scabies, burrows are often difficult to see. They are grey/white, curved, raised lines measuring several millimetres in length,[7] most commonly seen on the hands and wrists.[17]

Elderly/very young: In the elderly, skin lesions might be more widely distributed than in younger people. Infants often have vesicular lesions in areas without hair, including on the head, neck, soles of the feet and behind the ears.[6]

7. How large are scabies mites?

Scabies mites can be difficult to spot as they are rarely longer than 0.5 mm.[14]

8. What are the symptoms of crusted scabies?

In crusted scabies, itching may be mild.[3] Thick crusts and papules might appear anywhere on the body,[5] but are usually apparent on the:

- palms of the hands
- soles of the feet.[16]

Treatment

9. Which scabies treatments are available in the UK?

In the UK, four scabicides are used for the treatment of scabies: permethrin 5% cream, malathion aqueous 0.5% liquid, benzyl benzoate 25% emulsion and ivermectin.

Both permethrin 5% cream and malathion aqueous 0.5% liquid are available without prescription. Permethrin 5% cream is the first-line choice. Malathion aqueous 0.5% liquid can be used if permethrin cream is inappropriate (for example, allergy to chrysanthemums).[4,12,18]

Benzyl benzoate is not as effective as permethrin or malathion,[4] is generally no longer recommended,[12] and, should be avoided in children.[4]

Ivermectin is an orally administered drug, which is licensed in the USA for the treatment of strongyloidiasis and onchocerciasis infections[19] and in France for the treatment of strongyloidiasis and scabies.[20] It is available on a named-patient basis in the UK and is used mainly to treat crusted scabies that does not respond to topical treatment alone. For further information on treating crusted scabies, **see Question 26**.

10. How effective are these treatments?

Few published studies directly compare the scabies treatments that are currently used in the UK. The information available suggests that permethrin 5% cream is the scabicide of choice for classical scabies.[6,18,21,22] Based on the analysis of two trials for each comparison, a Cochrane review on scabies treatment[21] reported that topical permethrin was more effective than a single dose of oral ivermectin.[23,24]

In one of the permethrin versus ivermectin studies mentioned above[23], ivermectin 200 micrograms/kg was administered as a single dose to 40 patients with scabies; 45 other patients received a single, overnight, topical application of permethrin cream 5%.[23] By week two, treatment was considered to be effective (i.e. there was an improvement in pruritus, as assessed by a visual analogue scale) in 70% of patients in the ivermectin group and 97.8% of those in the permethrin group.[23]

In the second study comparing permethrin with ivermectin treatment, cure was defined as the absence of new lesions. Results from 27 ivermectin patients and 28 permethrin patients were analysed. Although all the ivermectin patients were cured after two weeks, the cure rate was higher for permethrin patients than for ivermectin patients at the end of week one (82% vs 56%, $p<0.05$).[24]

Another study looked at cure rates in three groups of patients with scabies who received either topical permethrin 5% (n=40), ivermectin 200 micrograms/kg/dose in a single dose (n=40) or two doses of ivermectin 200 micrograms/kg/dose with a dose interval of 2 weeks (n=40). Patients were followed up after 1,2 and 4 weeks. Cure rates in the permethrin, single-dose ivermectin and double-dose ivermectin groups were not statistically significantly different and were 94.7%, 90% and 89.7%, respectively. At week one, the score for pruritus, as assessed by patients using a visual analogue scale was significantly lower in the permethrin group than in either of the ivermectin groups ($p=0.001$ versus single-dose ivermectin, $p=0.004$ versus double-dose ivermectin).[25]

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Malathion is considered to be a second-line treatment but the Cochrane review did not identify any malathion trials. Uncontrolled trials with malathion 0.5% (single application left on skin for 24-48 hours) have found cure rates of 70-80% within 2-4 weeks.[18]

Analysis of five trials that compared ivermectin 100-200 micrograms/kg with benzyl benzoate 10%-25% for a Cochrane review showed that there was significant heterogeneity between the trials, perhaps due to the different drug regimens and follow-up periods used in the trials. Three trials, with follow-up periods of 1 week, 3 weeks and 30 days concluded that there was no significant difference between the treatments.[24,26,27] One trial found benzyl benzoate to be more effective after 14 days[28,] (RR=2.00, 95% CI 1.47 to 2.72), whereas another found a significant difference in favour of ivermectin after 30 days[29] (RR=0.13, 95% CI 0.03 to 0.53).

Benzyl benzoate is generally no longer recommended, permethrin and malathion having taken its place.[12]

Although licensed for the treatment of scabies, crotamiton is generally used only for itching following the treatment of scabies with more effective agents.[4]

Ivermectin has proven efficacy in crusted scabies when used with a topical mite killing drug.[15,30,31]

11. How safe are the scabies treatments that are available in the UK?

A review of existing safety data on topical malathion concluded that there is no evidence of serious systemic adverse reactions associated with its use.[32]

Like malathion, permethrin is not well absorbed and is metabolised quickly.[33,34] Topical use of permethrin is usually associated with only mild adverse effects.[35]

Known side effects of scabies treatments available in the UK include:

Permethrin: Burning/stinging sensations (usually mild, transient, and more common in patients with severe scabies) and skin irritation, e.g. rash/itching, erythema, oedema and eczema. These effects are usually transient.[36]

Malathion: Skin irritation and hypersensitivity reactions.[37]

Benzyl benzoate: Skin irritation, excoriations and (occasionally) rashes. A burning sensation may be experienced, especially on the genitalia.[4]

Ivermectin (available on named-patient basis only): aggravation of symptoms,[22] headache,[38,39] hypotension[38], abdominal pain[28,38] vomiting,[38] pustular rash,[26] cellulitis[26] and mild diarrhoea[28] have been noted in patients receiving ivermectin for scabies in clinical trials.

12. What can be used for post-scabetic itch?

Itching may continue for weeks after successful treatment for scabies,[4] but treatment failure should be suspected if the itching persists for longer than 2-4 weeks after the last application of scabicide.[40] Treat post-scabetic itch with crotamiton (2-3 times a day or once a day in children under 3) or, if the scabies mites have definitely been eradicated, with topical hydrocortisone 1%.[4] Night time use of a sedative antihistamine could be considered to help with sleep[4] and reduce scratching.[18] Dry skin/eczema can be treated with emollients.[41] Any creams/emollients should be applied after the topical scabicide has been absorbed into the skin.[18]

13. Who should be treated?

For treatment to be effective, those affected and all their household and close contacts need to be treated simultaneously (within a 24-hour period), regardless of whether they have symptoms.[12,18] If anyone is missed there is a high risk that they will reinfect the others.

14. Is a bath necessary before topical treatment?

No, scabicides should be applied to cool, dry skin. Vasodilation as a result of a warm bath, might cause the scabicide to be removed from the skin into the bloodstream too quickly,[4,6] perhaps resulting in decreased efficacy[4] and increased systemic side effects.

15. How should topical treatment be applied?

Apply treatment to cool, dry skin. Use a small (75mm) paintbrush,[10] not cotton wool [5] for liquid preparations. Creams can be applied by hand, but healthcare professionals who treat people routinely may wish to wear gloves to prevent the skin on their own hands from becoming irritated.[36]

Check that the **whole body** is covered. Although it is not in line with the advice given on the SPCs for permethrin[36] and malathion,[37] current expert advice for all people is to treat the head (i.e. scalp, neck, face and ears) as well as the rest of the body.[4] Avoid the areas around the eyes and mouth in children under 2 years,[36,37] but pay particular attention to the areas between the fingers and toes, the underside of the nails, wrists, armpits, external genitalia, breast, buttocks, and (in children under 2) the palms of the hands and soles of the feet.[36]

Leave the treatment on for 8-12 hours for permethrin 5%,[36] and for 24 hours for malathion 0.5%.[37] It can be applied before going to bed.[10] Reapply the treatment immediately if any areas of the body, e.g. hands, are washed during the treatment period.[4]

Wash off with cool water and then shower or bathe in the normal way.[10]

16. How many applications of topical treatment are required?

The current recommendation is to apply permethrin or malathion twice, leaving a period of 7 days between the two applications.[4] People with crusted scabies may require 2 or 3 applications of permethrin or malathion on consecutive days to ensure that enough penetrates the skin crusts to kill all the mites.[4]

17. How quickly does the treatment work?

Itching can continue for weeks after treatment but should be absent or reduced by 2-4 weeks after the last application of scabicide (see treatment of post-scabetic itch – **question 12**).[40] Lesions should heal within about 4 weeks of treatment.[21]

18. What signifies treatment failure?

New burrows at any stage after the second application of scabicide are indicative of treatment failure. By 2-4 weeks after the last application of insecticide, itching should have subsided. If itching is still present at this time, the person should be reviewed.[40]

19. Why does treatment sometimes fail?

Treatment will fail if the scabicide was not applied correctly or if simultaneous treatment of all the person's contacts did not occur.[18] Using cotton wool instead of a brush to apply liquid treatment might result in too little being applied.[5]

Re-infestation by an untreated contact is a common reason for treatment failure. Re-infestation should be suspected if symptom improvement was apparent 7-10 days after treatment, but symptoms recurred 2-3 weeks after treatment.[5]

Mites could become resistant to commonly used scabicides. In 2005, it was reported that resistance to permethrin may be emerging.[42] A questionnaire survey of dermatologists in the UK in 2000 suggested that there might also be some resistance to malathion.[43]

Topical treatments may not penetrate crusts in people with crusted scabies. If treatment had failed for this reason, crust scrapings would contain live mites.[5]

The possibility of misdiagnosis should be considered in treatment failure.

20. What are the treatment options if a first course of treatment fails?

If burrows are still present after a course of permethrin 5% cream, further treatment options are available. A second course of permethrin 5% could be prescribed, ensuring that further advice on administration technique and adherence to treatment is supplied. Alternatively a scabicide from a different chemical class could be prescribed e.g. malathion 0.5%. This type of prescribing might help to prevent the development of resistance, although it is conceivable that mites could develop resistance to both permethrin and malathion. If this occurred, benzyl benzoate might be effective,[5] but it is an irritant. Furthermore, benzyl benzoate is not as effective as permethrin and malathion, and should be avoided in children.[4] Ivermectin has been used successfully in classical scabies.[21,31,44]

21. What is the recommended treatment for a young child?

Use permethrin 5% cream or aqueous malathion 0.5% in young children. Permethrin 5% (Lyclear® Dermal Cream) is licensed for the treatment of scabies in children from the age of 2 months. Children aged between 2 months and 2 years should be treated under medical supervision.[36] Aqueous malathion 0.5% (Derbac-M® Liquid) is licensed for treating scabies in children aged 6 months and over. Use of Derbac-M® Liquid in children younger than 6 months is contraindicated except on medical advice.[37] Scabies is rare in infants younger than 2 months.[18]

Mittens and socks should be considered to prevent infants from sucking the permethrin or malathion off their thumbs and toes.[42]

The safety of ivermectin in children weighing under 15kg has not been established.[19]

22. Should children with scabies be kept away from school?

Children with scabies can attend school after the first application of treatment. However, all family members and close contacts should be treated at the same time to avoid treatment failure.[18]

23. How should scabies be treated during pregnancy?

Based on the available information, topical permethrin and malathion are both suitable for treating scabies in fit and healthy pregnant patients. Systemic absorption following topical administration is low with both preparations and the risk of congenital malformations would not be expected to increase following exposure to either during pregnancy.[45]

24. How should scabies be treated in a breastfeeding mother?

It is unknown whether permethrin is secreted into human breast milk following topical administration to the mother. However, the absorption following topical administration of permethrin is less than 2% and it is metabolised rapidly.[46] Also, Lyclear dermal cream (permethrin 5%) is licensed for the treatment of scabies in babies as young as 2 months.[36] Systemic absorption following topical administration of malathion is also low[45] and the manufacturers of Derbac M liquid (malathion 0.5%) state that it can be used with caution during breastfeeding as there are no known effects in lactation.[37]

The Prodigy Summary for Scabies recommends permethrin 5% dermal cream as a first-line treatment in breastfeeding mothers, and malathion 0.5% aqueous liquid if permethrin is inappropriate for any reason, e.g. if mother is allergic to chrysanthemums.[18,47] The reason for recommending permethrin 5% dermal cream as a first-line treatment is that there is more supportive evidence for the use of permethrin than malathion.[18]

Skin irritation following direct contact with the treatment on the mother's skin may occur in babies exposed to permethrin or malathion during breastfeeding. To minimise exposure of the baby to the preparation, the cream or liquid should be removed from the breast before feeding, and reapplied afterwards.[18]

25. How should crusted scabies be treated?

Seek specialist advice when treating crusted scabies.[18] Orally administered ivermectin has demonstrated efficacy in crusted scabies[15,44] Two doses of ivermectin 200 micrograms/kg with a fortnight in between doses has been found to be effective, but additional doses are required in severe cases.[18] Combining ivermectin with topical treatment, e.g. permethrin or benzyl benzoate has shown efficacy even in severe cases[15,30] Single-dose ivermectin 200 micrograms/kg by mouth in combination with topical drugs has been used after failure of topical treatment alone.[4] A recent review recommended using topical permethrin 5% every 2 to 3 days for 1 to 2 weeks and oral ivermectin 200 microgram/kg/dose, taken with food, as three doses (days 1,2 and 8), five doses (days 1,2,8,9 and 15) or seven doses (days 1,2,8,9,15,22 and 29), according to the severity of the infection.[48]

A keratolytic agent such as salicylic acid ointment 2% can be used twice daily to dislodge crusts.[6] Scrubbing crusted areas under the nails might also help to shorten the course of topical drug therapy.[15]

26. Is there any need to decontaminate items with which the person with classical or crusted scabies has come into contact?

Classical scabies: Following treatment for scabies, the Health Protection Agency advises that there is no evidence to suggest (classical) scabies is transmitted on clothing, towels and bedding and therefore no special cleaning or laundering measures other than the usual hygienic ones are required following treatment.[12] Other guidance recommends washing these items at a temperature

of above 50°C.[18] Placing clothing or footwear that cannot be washed in a plastic bag for 72 hours will also kill mites.[18]

Crusted scabies: In a recent report, the Health Protection Agency acknowledged that fomites such as bedding, towels, soft furnishings and equipment might be involved in the dissemination of crusted scabies.[12] It may therefore be advisable to wash items at temperatures above 50°C. Careful vacuuming of furniture and carpets in the rooms used by these people is recommended.[40]

27. What precautions should be taken by people caring for people with crusted scabies?

Guidance varies, however publications have indicated that gloves and gowns/aprons offer sufficient protection to staff caring for people with crusted scabies.[15,49]

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