GUIDELINE

European guideline for the management of scabies

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Abstract

Scabies is caused by *Sarcoptes scabiei* var. *hominis*. The disease can be sexually transmitted. Patients' main complaint is nocturnal itch. Disseminated, excoriated, erythematous papules are usually seen on the anterior trunk and limbs. Crusted scabies occurs in immunocompromised hosts and may be associated with reduced or absent pruritus. Recommended treatments are permethrin 5% cream, oral ivermectin and benzyl benzoate 25% lotion. Alternative treatments are malathion 0.5% aqueous lotion, ivermectin 1% lotion and sulphur 6–33% cream, ointment or lotion. Crusted scabies therapy requires a topical scabicide and oral ivermectin. Mass treatment of large populations with endemic disease can be performed with a single dose of ivermectin (200 micrograms/kg of bodyweight). Partner management needs a look-back period of 2 months. Screening for other STI is recommended. Patients and close contacts should avoid sexual contact until completion of treatment and should strictly observe personal hygiene rules when living in crowded spaces. Written information should be provided to suspected cases.

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Statement on declarations of interest

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Guideline development

This guideline has been updated by reviewing the existing guidelines including the European Guideline for the Management of Scabies (2010),[1] the CDC guidelines (2015)[2,3] and the BASHH guideline (2007).[4] A comprehensive literature search of publications from 2010 to April 2016 was also conducted (Appendix 2. Search strategy).

New information in this guideline since the 2010 edition:

- New treatment recommendations.
- Addition of a section on mass population treatment.
- Audit standards added.

Epidemiology

Scabies is an infectious disease caused by infestation with the parasite *Sarcoptes scabiei* var. *hominis*. The infestation occurs by skin-to-skin contact including sexual contact or, less commonly, by contact with infested fomites (e.g. clothing and towels). *S. scabiei* mites burrow into human epidermis in which the female parasite lays eggs that hatch and develop into adults in 2 weeks. The life cycle of *S. scabiei* is 4–6 weeks. *S. scabiei* var. *hominis* is an obligate human parasite. Adult parasites die outside their human host within 24–36 h.[5] Immature mites can survive 1 week.[6] The mites and mite products (faeces, eggs and dead parasites) generate an immediate or delayed (type IV) hypersensitivity reaction with scabies symptoms typically starting 3–6 weeks after primary infestation and 1–3 days after re-infestation.[7,8] In classical scabies, there are under 5–15 mites/host. Crusted scabies is characterized by a much higher burden of mites in the infested individual.[9] Human infestation with other *S. scabiei* variants (e.g. var. *canis* hosted by dogs and var. *suis* hosted

All authors had equally contributed.

by pigs) is self-limiting and considered non-transmissible from human to human.[10,11]

Clinical features [12]

Specific manifestations include intense itch and disseminated inflammatory papules. Non-specific manifestations which may also occur are skin excoriation, secondary eczematization and impetiginization.

1 Classical scabies [1,4,5,7]
   a occurs in patients with normal immune response;
   b intense pruritus which is worse at night;
   c erythematous papules disseminated on the periumbilical area, waist, genitalia, breasts, buttocks, axillary folds, fingers (including interdigital spaces), wrists and extensor aspects of the limbs. The head, palms and soles are usually spared in adults;
   d the papules are small, often excoriated with haemorrhagic crusts on top;
   e the burrow (a pathognomonic sign) appears as a thin, brown-grey line of 0.5–1 cm but is rarely observed due to excoriation or secondary bacterial infection;
   f other lesions: vesicles (usually at the start of a burrow), nodules (firm, 0.5 cm in diameter, usually on the male genitalia, groin, buttocks), weals;
   g poor hygienic conditions may result in secondary bacterial infection;
   h irritant or allergic contact eczema can be induced following topical treatment.
2 Crusted scabies (the term 'Norwegian scabies' should no longer be used)[1,4,13]
   a occurs in patients with severe immune deficiency due to disease (e.g. AIDS, HTLV1-infection, malignancy and leprosy) or therapy (e.g. immunosuppressant drugs and biologicals[14–16]), neurological disease causing reduced sensation, immobility with reduced ability to scratch or in genetically susceptible patients[17];
   b pruritus is mild or absent;
   c skin lesions consist of generalized, poorly defined, erythematous, fissured plaques covered by scales and crusts. On bony prominences (e.g. finger articulations, elbows and iliac crest), the plaques have a yellow-to-brown, thick, verrucous aspect;
   d diffuse non-crusted scabies with involvement of the back may also occur[12];
   e bacterial secondary infection can result in malodorous skin lesions.

Diagnosis

Diagnosis is suspected on the characteristics of itch (generalized, intense at night), clinical findings and suggestive history (e.g. positive context for contamination, disease observed in close contacts). Definitive diagnosis is supported by a positive microscopic examination of skin scrapings which identifies mites, eggs or faecal pellets ('scybala').[18] To enhance the results, the groove done by the parasite can be opened with a fine needle and Muller oil or immersion oil is applied to bring the acarus at the surface.[19,20] A negative microscopic result does not exclude scabies.[12,21]

Dermoscopic examination can identify skin burrows, mites (the 'delta' sign at the end of the burrow represents the anterior body of the adult female mite),[22] eggs and can orientate the site of skin scrapings.[19] In sexually active patients, STI screening (including HIV test) is recommended {level of evidence Ib; grade A recommendation}.[23]

General principles of treatment (Fig. 1)

Ten new clinical trials on scabies treatment have been published since the previous guideline in 2010.[24–33] Recent data are focused on mass population treatment, usually with ivermectin. Based on the existing comparative studies addressing the efficacy of different antiscabetic treatments, a distinction was made only between 'recommended' and 'alternative' treatments. The availability of antiscabetic drugs differs in European countries; therefore, in practice, the choice of the treatment to use is also variable.

Topical treatment should be applied to all skin regions including scalp, groin, navel, external genitalia, finger and toe web spaces and the skin beneath the ends of the nails at night and left in place for 8–12 h. The skin should be cool and dry. A second application is recommended after 7–14 days. After applying treatment, patients should change into clean clothing. All the patient's close personal contacts should be treated simultaneously to avoid re-infestation.

Clothing, bedding, towels and other items should be machine washed (at 50 °C or higher), dry-cleaned, or sealed and stored in plastic bag for 1 week {level of evidence VI; grade C recommendation}.[6]

Patients should be given a detailed explanation of their infestation together with clear written information {level of evidence IV; grade C recommendation}.[1]

The infestation is considered cleared if 1 week after the end of treatment there are no manifestations of active scabies (no active lesions, no nocturnal pruritus). Post-treatment itch may persist for up to 2-4 weeks.

Recommended treatments

- Permethrin 5% cream applied head to toe and washed off after 8–12 h. The treatment must be repeated after 7–14 days {evidence Ib; grade A recommendation}.[34]
- Oral ivermectin (taken with food) 200 micrograms/kg as two doses 1 week apart {level of evidence Ib; grade A recommendation}.[35]
- Benzyl benzoate lotion 10–25% applied once daily at night on 2 consecutive days with re-application at 7 days {level of evidence IV; grade C recommendation}.[7,36]

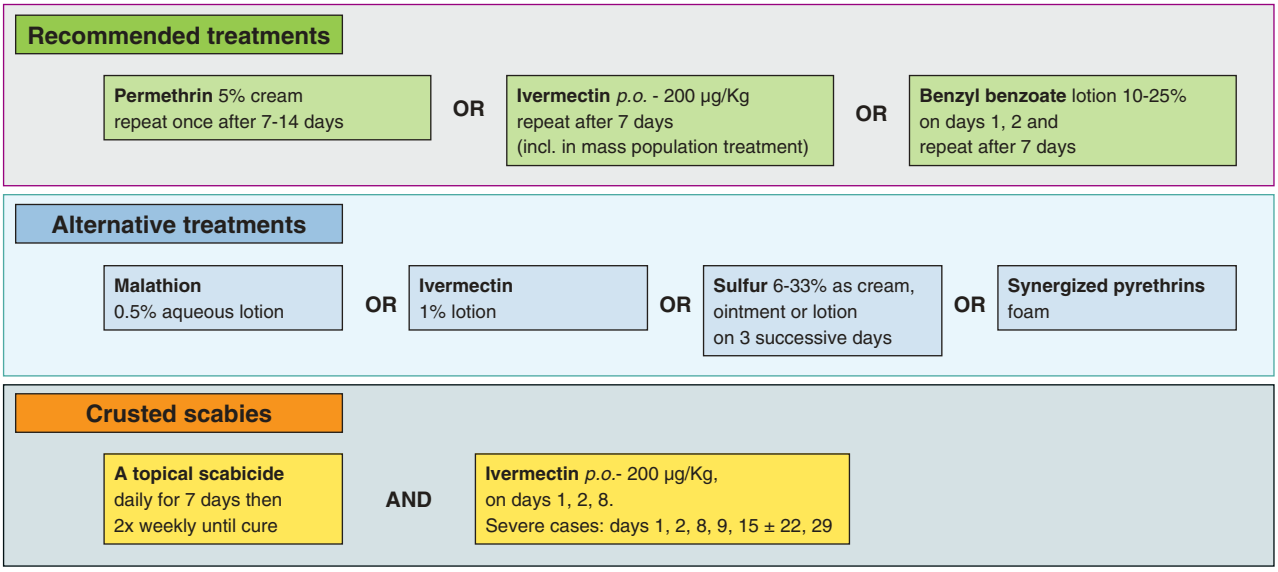

Figure 1 Scabies: general principles of treatment.

Alternative treatments

- Malathion 0.5% aqueous lotion {level of evidence IV; grade C recommendation}.[37]
- Ivermectin 1% lotion was reported to be as effective as permethrin cream 5% {level of evidence Ib; grade A recommendation}.[28]
- Sulphur 6-33% as cream, ointment or lotion is the oldest antiscabetic in use.[38] It is effective and requires application on three successive days {level of evidence Ib; grade A recommendation}.[1,38,39]
- Synergized pyrethrins are available as a foam preparation in some countries and are as effective as permethrin cream 5% {level of evidence IIa; grade B recommendation}.[1,40]
- Lindane is no longer recommended because of its potential to cause neurotoxicity.[1]

Crusted scabies[2]

- A topical scabicide (permethrin 5% cream or benzyl benzoate lotion 25%) repeated daily for 7 days then 2x weekly until cure
  AND
- Oral ivermectin 200 micrograms/kg on days 1, 2 and 8. For severe cases, based on persistent live mites on skin scrapings at follow-up visit, additional ivermectin treatment might be required on days 9 and 15 or on days 9, 15, 22 and 29 {level of evidence IV; grade C recommendation}.[2]

Post-treatment itch

Post-treatment itch should be treated with repeated application of emollients. Oral antihistamines and mild topical corticosteroids may also be useful.

Special situations

- Permethrin is safe in pregnancy {level of evidence III; grade B recommendation}[41] and lactation[42,43] and is licensed for use in children from age 2 months onwards.[3,37]
- Benzyl benzoate and sulphur are considered safe in pregnancy {level of evidence III; grade B recommendation}.[1]
- Ivermectin should not be used during pregnancy or in children weighing less than 15 kg.[44]
- Malathion was not studied in pregnant women. Animal studies suggest that there is no risk. However, animal reproductive studies are not always predictive of human responses.[45] Inappropriate use of agricultural grade malathion for treating human infestations can induce acute toxicity {level of evidence IV; grade C recommendation}.[46]

Mass population treatment {level of evidence Ib; grade A recommendation}[24,26,33]

- Mass population treatment is recommended for the control of scabies in endemic areas, for example remote communities or mass population displacements, and in the management of epidemics in closed communities such as nursing homes or jails.
- All individuals should be treated irrespective of symptoms.
- Oral ivermectin is easier to administer than traditional topical scabicides, thus facilitating treatment of large populations.
- A single dose of oral ivermectin 200 micrograms/kg of bodyweight is effective.[24,33]
- Ivermectin may not sterilize scabies eggs, and a second dose given after one week has been shown to increase the response.[47] The administration of a second dose of ivermectin is recommended[46,48] {level of evidence Ib; grade A recommendation} although the importance of this second dose for scabies control need to be further evaluated.[46]
- Drug resistance to scabicides including permethrin and ivermectin is an emerging concern,[49–52] and the impact of mass treatment programmes on development of drug resistance requires future study.

Follow-up

A follow-up visit 2 weeks after completion of treatment is recommended for a test of cure by microscopy examination {level of evidence IV; grade C recommendation}.[1]

Partner management

Patients should be advised to avoid close contact until they and their sexual partners have completed treatment {level of evidence IV; grade C recommendation}.[1]

Infestation in children due to sexual abuse is rare and is more usually associated with close non-sexual contact.

Assessment and epidemiological treatment is recommended for sexual partners over the past 2 months {level of evidence IV; grade C recommendation}.[53,54]

Prevention/health promotion

The risk of scabies can be reduced by limiting the number of sexual partners and observing strict personal hygiene when living in crowded spaces (e.g. no sharing of underwear clothing, bedding and towels and avoidance of skin-to-skin contact). Transmission is not prevented by condom use. No No additional preventive measures have been shown to be effective.[55]

Auditable outcome measures

- Patients with scabies should be invited for a follow-up visit: target 95%.
- Suspected cases of scabies should be treated with a recommended regimen: target 95%.
- Suspected cases of scabies should have access to written information about the disease: target 95%.

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Appendix 1

- Composition of editorial board: www.iusti.org/regions/Europe/pdf/2013/Editorial_Board.pdf
- List of contributing organizations: www.iusti.org/regions/Europe/euroguidelines.htm
- Tables of levels of evidence and grading of recommendations: www.iusti.org/regions/Europe/pdf/2013/Levels_of_Evidence.pdf

Appendix 2 Search strategy

Resources

- PubMed (http://www.ncbi.nlm.nih.gov/pubmed)
- Biomedical Reference Collection (via EBSCO Host - http://web.ebscohost.com/ehost/)
- Medline (via EBSCO Host - http://web.ebscohost.com/ehost/)
- Cochrane Collaboration Databases (www.cochrane.org).

Keywords

Scabies		
Sarcoptes scabiei	Combined	Clinical trial
Pyrethrins	with	Diagnosis
Permethrin	AND	Therapy
Malathion	Search	Resistance
Ivermectin		Large population
Lindane		Emigrants

Searches were performed in January – May 2016.