

# Identification and treatment of scabies in infants

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James Bethel outlines the signs and symptoms of mite infestation in babies and young children, and how to manage the condition in an emergency department

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## Abstract

Incidents of scabies are increasing nationally and globally, particularly among certain vulnerable groups. This article examines a rare and unusual case of scabies infestation in infancy and highlights the importance of recognising the differences in presentation of infestation in infants to enhance early diagnosis and treatment.

### Keywords

Scabies, infestation, dermatology, infants, rash

THE SCABIES mite is a parasite, not visually apparent because of its small size, that infests the epidermal layer of its human host's skin (Figure 1). Progression of the infestation is led by the female mite, which produces eggs during burrowing activity that then mature into adult mites (Tidman and Tidman 2013).

Most people with the infestation have an average of 12 mites within the epidermis (Johnston and Sladden 2005), but this can increase significantly in people who are immunosuppressed, immunologically immature, in older people and in those with an inability to scratch pruritic lesions (Heukelbach and Feldmeier 2006, Tidman and Tidman 2013).

Globally the annual incidence of scabies is approximately 300 million (McCarthy *et al* 2004) and, although there is little recent data on prevalence in the UK, it is believed to be generally increasing with approximately 100,000 people treated in primary care each year, and rising particularly in the north of the UK, in metropolitan areas and among women and children (Downs *et al* 1999).

This infant was only six weeks old, which meant he was vulnerable to multiple lesions secondary

to immunological immaturity and his inability to scratch; scratching removes a certain number of lesions and people with greater psychomotor maturity are able to do this (McCarthy *et al* 2004, Tidman and Tidman 2013).

These multiple lesions can be numbered in their thousands or millions in terms of the number of mites infesting the epidermis. There is no evidence that they are any more virulent than when occurring in smaller numbers (Clinical Knowledge Summaries 2011). However, their overall volume in episodes of 'crusted' scabies makes them more challenging to treat. Most deaths attributed to scabies infestation are secondary to an episode of systemic sepsis as a consequence of crusted scabies (McCarthy *et al* 2004, Fox and Usatine 2006).

Despite historical associations with poor hygiene and poverty, the scabies mite does not differentiate between people who practice good hygiene and other groups of patients (Chosidow 2006, Tidman and Tidman 2013). However, as a consequence of previous assumptions about epidemiology, which is sometimes reinforced by clinicians who may make value judgements about infested patients, there is a widespread social stigma associated with contracting an episode of mite infestation (Jin-Gang *et al* 2010, Tidman and Tidman 2013).

The mother of this infant certainly felt this stigma when I told her I suspected she had scabies and had transmitted it to her son, so I spent time reassuring her that no value judgements were being made about her parenting abilities.

Transmission is by direct skin-to-skin contact usually of a prolonged nature and can therefore be more likely among carers of dependent patients, within family groups or as a sexually transmitted infestation (Chosidow 2006, Fox and Usatine 2006).

The scabies mite can progress at the rate of approximately 2.5cm per minute over skin and impregnation of the superficial epidermis takes place over a period of around 30 minutes. Subsequently the female mite will produce between one and three eggs daily (McCarthy *et al* 2004, Chosidow 2006).

Transmission via infested bed-linen and furnishing is now thought to be of less significance than was previously the case; although the mite can survive without a human host for around 72 hours, transmission from such sources is not thought to account for most infestations (Chosidow 2006, Tidman and Tidman 2013) and is more likely when the infestation is crusted as the crust itself provides a source of sustenance for the mite (Tidman and Tidman 2013).

McCarthy *et al* (2004) report a dated but intriguing study of transmission via infested bedding in which 272 healthy volunteers occupied beds recently vacated by heavily infested patients and only four of them, representing 1.5% of the volunteer group, were subsequently infected (Mellanby 1944). Prolonged survival of a dormant mite can also be facilitated by ambient temperature, with survival more likely below 20°C (Barry *et al* 2013).

## Clinical presentation

Patient history plays a significant part in the diagnosis of scabies, with the presence of nocturnal and heat-aggravated pruritis, chronicity of symptoms and contact history all raising suspicion of the infestation (Fox and Usatine 2006, Tidman and Tidman 2013). To avoid delay in diagnosis and treatment, it is important to be aware that clinical manifestation can differ by age and level of immunocompetence.

Adults display the 'classic' features of scabies noted above in addition to typical distribution of lesions most commonly seen in the webspaces of fingers, the thenar and hypothenar eminences of the palm, the flexor creases of the wrist, the dorsal aspect of the feet, the axillae and, in particular where spread may have been by sexual contact, on the abdomen, lower portions of the buttocks and genitalia (Johnston and Sladden 2005, Barry *et al* 2013). Women with the condition may also complain of lesions around the areola of the breasts (Barry *et al* 2013). In immunocompetent adults, the plantar surfaces of the feet, and the face and scalp are usually spared from infestation (Barry *et al* 2013, Tidman and Tidman 2013).

Infants and young children often present with atypical distribution of the lesions, which is believed to account for a proportion of misdiagnosis

in this age group, especially in infants and pre-verbal children where symptoms cannot be directly reported (Johnston and Sladden 2005).

In infants and children, the infestation is sometimes initially diagnosed as eczema, dermatitis or impetigo, and where crusted scabies is evident the raised plaques formed by encrustation of multiple lesions have sometimes been mistaken for psoriasis (Johnston and Sladden 2005, Fox and Usatine 2006).

Scabies mite infestation can trigger eczematous lesions and, through secondary staphylococcal infection - usually subsequent to scratching at lesions, it also has a high association with impetigo infection (Johnston and Sladden 2005, Chosidow 2006). Unlike adults, infants and children may suffer infestation of the face, neck and scalp in addition to the plantar aspect of the feet and more extensive lesions on the palmar surface of the hands (Johnston and Sladden 2005, Barry *et al* 2013).

Recent research found that involvement of the scalp and plantar surfaces of the feet were seen exclusively in patients less than two years old, and facial involvement was similarly unique to those under 15 (Boralevi *et al* 2014). Infants and young children may therefore present with both atypical distribution of lesions and non-specific symptoms such as poor feeding, disturbed sleep pattern and apparent distress (Johnston and Sladden 2005). As a result, diagnosis of children in this age group can be difficult.

Patients who are immunosuppressed are at additional risk of multiple atypical lesions and are more prone to the crusted (Norwegian) form of the infestation. Immunosuppression in itself can make pruritis a less significant feature of infestation secondary to a lack of immune response to the

Figure 1 Scabies rash on the chest and arm of an infant, and (inset) the parasite



## Case study

One weekday afternoon a young mother and her six-week-old infant son presented to the emergency department (ED). The mother said that a generalised rash had appeared on the baby several days earlier, and that he was becoming increasingly irritable and reluctant to feed. The mother had attended a walk-in centre 24 hours earlier and had been advised that she and her child had eczema. The infant had been prescribed an emollient cream but this had not been of any therapeutic benefit, though the time since initial administration had been short.

On closer questioning it was discovered that the mother had not previously had eczema and was normally fit and well. Her pregnancy had been uneventful and the baby was born at full term by vaginal delivery with no post-partum problems. The child had no siblings.

The mother was separated from the biological father and had been living with her maternal grandmother for ten days. Before this she and the baby had been living in a women's refuge since discharge from hospital.

The mother's primary concern was that the baby was not improving with the treatment prescribed; he had become intermittently inconsolable, was not sleeping well at night, and was reluctant to take as much formula milk as he had been.

On examination the baby had erythematous dry flat linear lesions on his extremities, chest, abdomen, face and scalp, and he was distressed. Physical examination otherwise revealed little of note; air entry was equal and vesicular, there were no ear nose and throat abnormalities, he was not febrile and he had been passing urine and stools normally despite his slightly reduced oral intake.

While his mother was helping me to examine her son, I noted some similar-looking lesions in the webspaces of her left hand and asked how long they had been evident and whether she had reported them to anyone. She said that they had been there for around two weeks and that these were the lesions she had been advised were eczematous when she visited the walk-in centre.

On further examination she reported and exposed similar lesions in the webspaces of her right hand and in the flexor creases of the right wrist, elbow and both

knees. She said that she had also recently developed a rash on her abdomen.

Given the distribution of the lesions on the mother I began to suspect that she may have a scabies mite infestation and this impression was reinforced when she said they were markedly pruritic at night and on exposure to heat. The similar nature of the baby's rash, although its distribution was more generalised, along with reports of his night-time distress, suggested that she might have inadvertently infested her son with scabies mites.

On this occasion I initially sought advice from the on-call paediatric consultant and registrar; however, they confessed a lack of confidence and experience in management of scabies in such a young infant and recommended that I contact the on-call dermatological team based outside of the trust I work in. The dermatology registrar expressed some doubt about my diagnosis on the reasonable basis that this was such an uncommon presentation in young infants and the lesions were not typically or classically characteristic of scabies as seen in older children and adults.

On the request of this registrar, and with the consent of the baby's mother, medical photographs were taken and uploaded to the trust's information technology system for remote viewing by the dermatology team.

After seeing these images the dermatology consultant and registrar agreed that, considering the history provided and the appearance of the lesions, the baby most probably did have scabies infestation. Having identified that recommended treatments were not advocated or licensed for use in babies of this age, it was decided, after weighing up the potential benefits and disadvantages, that he should nevertheless be prescribed permethrin topical cream. This was also prescribed for his mother and other close contacts, based on public health recommendations (Clinical Knowledge Summaries 2011).

The mother and baby were discharged with written instructions about the nature of the infestation and the appropriate method to treat it. Documentation was also provided so that the family's primary care provider was aware of the circumstances of attendance and would be able to monitor the effectiveness of care provided.

by-products of mite infestation, such as faecal droppings and this can again render diagnosis more challenging. Immunosuppressed patients or those treated with steroids may not therefore give a typical account of intense nocturnal pruritis and heat aggravation in a form of scabies known, for obvious reasons, as scabies incognito (Chosidow 2006, Binic *et al* 2010)

## Treatment

Scabies is rare in infants younger than two months and standard treatment regimens are not licensed for use in this age group (Clinical Knowledge Summaries 2011, British National Formulary for Children 2014). Treatment for older children and adults involves topical application of permethrin for eight to 12 hours with a repeat dose after one week where necessary (Public Health England 2013). It is recommended that infestation in infants younger than two months is managed with the advice and assistance of a paediatric dermatologist (Clinical Knowledge Summaries 2011).

A case study describing the presentation of an infant with scabies is shown opposite.

## Conclusion

If the baby discussed in the case study had attended the ED with anyone other than his mother, diagnosis would have been difficult given the atypical distribution of his lesions and inability to describe the typical nocturnal and heat-aggravated pruritis. Clinicians should be aware that infants and young children may not present with a history or symptoms regarded as characteristic of scabies.

A high index of suspicion should be evident when treating infants and young children with such non-specific presentations and a comprehensive contact history should be sought. Additionally lesions that unusually involve the face, scalp and plantar aspects of feet in these age groups should suggest the possibility of scabies.

Given the association between impetigo and scabies, scabies infestation should be considered as an underlying contributory factor in patients with chronic and persistent impetigo. Especially young infants who are prone to multiple infestation and crusted episodes of scabies, should also be re-evaluated when treatment for presumed eczema or psoriasis appears to have been unsuccessful.

## Online archive

For related information, visit our online archive and search using the keywords

## Conflict of interest

None declared

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