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Scabies

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BACKGROUND

This article describes a scabies outbreak at a boarding school where failure of the first-line therapy was suspected.

CASE PRESENTATION

A group of five students, two of whom were room-mates, presented with a varying degree of pruritic papular rash. Repeated treatments with permethrin monitored by the school nurse, in conjunction with a rigorous hygiene regimen, proved to be ineffective. Eventually all five students were prescribed a combination therapy consisting of permethrin and ivermectin. This treatment proved effective in all five students. Despite closely monitored treatment, monotherapy with permethrin failed in all five patients. We discuss whether the lack of response was due to failed application, inability to rid the home environment of mites, reinfection by unidentified infected individuals or increased tolerance to permethrin.

INTERPRETATION

Repeated therapeutic failure when permethrin was used under controlled conditions and documented mechanisms for increased tolerance may indicate the last possibility. We therefore call for additional research on this topic.

Treating scabies can be challenging. We describe an outbreak of scabies at a boarding school where increased tolerance to the first-line therapy was suspected.

Five pupils at a boarding school were treated for suspected scabies. The pupils lived in shared rooms across five buildings. For about six months, the pupils received repeated

permethrin treatment from the school nurse and the health personnel in their home countries. A doctor was contacted as the problem remained unresolved. The pupils belonged to the same group of friends, and two of them lived in the same room.

All five came to the first medical consultation with papular rash on their arms, torso and thighs. Scabies tracks were found on their hands and wrists. Two of the patients had a papular rash on the scrotum. All except one were troubled by itching, particularly at night and when taking hot showers. The relatively untroubled patient also had a distinct papular rash and scabies tracks.

To confirm the diagnosis, the patients were sent to the Department of Dermatology for assessment. Prior to their appointment, they had been treated with a topical steroid to reduce itching, and thereby increase the chance of finding scabies by means of microscopy. The diagnosis of all five was confirmed by findings of live scabies mites.

On the recommendation of the Norwegian Institute of Public Health and the Department of Dermatology, only the affected patients and their close contacts, i.e. close friends and room-mates, were treated. The infected patients were isolated, while contacts were treated in their rooms. Their clothing was washed and set aside for a week prior to the course of treatment. The patients and their contacts were given new bedclothes, duvets and pillows. Their mattresses were changed. They were instructed in the use of the permethrin cream, and the school nurse saw to it that this was done according to current guidelines. The procedure was repeated a week later. A total of 26 pupils (patients and contacts) were treated. The patient who underwent the most courses received combination therapy consisting of permethrin and ivermectin.

Eighteen days after treatment, three of the patients who had undergone monotherapy returned with increasing papular rash and pruritus. As they had recently received treatment, the possibility of isolating live mites at this point was considered unlikely. The patients received itch-relief treatment and an appointment was made for a follow-up. Three weeks later, all five patients presented with worsening symptoms, and one of them chose to travel to their home country for further treatment. The others were again referred to the Department of Dermatology. All the patients except the one who underwent combination therapy received a diagnosis of scabies on the basis of microscopic detection of live mites. Permethrin monotherapy was judged a failure. It was therefore decided to treat the patients with a combination of permethrin and ivermectin. The treatment was administered twice, one week apart. In this case, the patients were recommended not to wash off the permethrin cream for 18 hours, as opposed to after 8–12 hours, which is the usual recommendation (1). None of the 21 contacts had scabies symptoms.

Discussion

Given the apparently increasing incidence of scabies, the lack of efficacy of permethrin and difficulties associated with deliveries, treatment may be challenging (1). In order to increase the focus on scabies, it was placed on the WHO list of neglected tropical diseases in 2017 (2). According to current guidelines, permethrin is the primary management choice, followed by ivermectin (1, 3). Permethrin has proved efficacious (4), but in vitro studies have demonstrated increased tolerance (5, 6). This increase in tolerance is related to disruptions in biochemical processes (7). We have not found publications where tolerance has been found in vivo for permethrin.

It is interesting that repeated treatments with permethrin were apparently ineffective, and we suspect that the therapeutic failure in these patients may be attributable to one of four factors: the patients failed to administer the permethrin cream according to procedure; there had been failure to eradicate the mites from the living environment; there are still unidentified cases of scabies at the school; or that we are witnessing the development of tolerance to permethrin.

Stringent steps were taken regarding hygiene at the school to eradicate the scabies mites.

The patients administered the treatment themselves according to precise instructions and with close monitoring and follow-up by the school nurses. Verbal communication between the school nurses and the pupils was good, and expenses were covered by the school. It is unlikely that stricter control of conditions could have been achieved.

Repeated therapeutic failure was seen, despite controlled treatment. Only when it was decided to combine permethrin treatment with ivermectin did all five patients rid themselves of the problem. There may be reason to believe that in this case tolerance of the scabies mite to permethrin has been witnessed. There are few studies that show increased tolerance, and several of those that do are old. At the same time, there is no standardised method of testing for permethrin tolerance (5, 6). We see a need for further research to study possible development of tolerance and whether guidelines need to be adjusted/changed.

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