

# Editorial

## Scabies pandemic and treatment failure, a real nuisance

Scabies is an extremely pruritic contagious skin disease caused by the *Sarcoptes scabiei* var. *hominis* mite.<sup>1</sup> It spreads mostly via direct skin contact or sharing linens and clothing. Systemic complications of scabies with a disrupted skin barrier due to constant scratching can occur, which may serve as a portal of entry for organisms leading to super infections, rheumatic fever or glomerulonephritis.<sup>2</sup>

It is estimated that more than 200 million people are still suffering from scabies worldwide, where scabies is endemic in some of the subtropical regions. Important risk factors for scabies include young age, a large number of children in the home, low family income, and poor accommodation.

Scabies infestation exhibits a disproportionate effect on children in low-income countries and tropical regions. The prevalence is higher in schools, madras and boarding houses where they gather in a large mass. The severity of pruritus, which worsens at night, can range from mild symptoms to highly uncomfortable reactions affecting the quality of life (that disturb patients' sleep or impair their concentration at school).<sup>3</sup>

Scabies is treated by topical application of Permethrin either alone or in combination with systemic Ivermectin. In the case of crusted scabies systemic ivermectin is used at a larger dose with multiple applications of permethrin. Other modalities are benzyl benzoate, Crothamiton, Monosulfiram, Gamma benzene hexachloride and sulphur. In April 2021, Spinosad topical suspension 0.9%, was approved by the Food and Drug Administration for treating scabies infestations in adult and pediatric patients 4 years of age and older. Treating all people in contact with the infected patient and preparing clothing and furniture appropriately is of utmost importance to prevent reinfection.<sup>4</sup> Topical scabicides are often applied incorrectly and following instructions are not adapted accordingly, causing a longer course of disease and longer infectiousness. This notable increase in scabies cases even in western countries might be explained by an increase in migration of people there from tropical and sub-tropical countries and the emergence of factors known to

favour the disease (e.g. poverty, poor sanitation, high population density and household crowding).<sup>5</sup>

Resistance of mites to permethrin in developed countries was reported as early as 1999 and an in-vitro analysis in 2000 showed protracted survival, with 35% of mites still alive after 3 h and 4% still alive after 18–22 h of constant exposure.<sup>6</sup>

The German guidelines recommend permethrin for common scabies, as it is applied locally and usually needs to be used just once. Whether repeated treatment is needed has not been answered yet but seems worth it even in uncomplicated cases. Repeated application is recommended in cases of crusted scabies, severe scabies (e.g. many papules caused by burrows), immunosuppressed patients, doubt as to whether initial treatment was consistently followed, and scabies outbreaks in care homes and situations in which multiple individuals are affected. When large populations with a high prevalence of scabies are treated, systemic ivermectin seems to be superior to topical treatment.<sup>7</sup> Predictors of treatment failure are associated with the immune status of the host, selection of therapeutic molecule, re-exposure to the mites and drug resistance. Treatment failure is reported low with permethrin and ivermectin used concomitantly. Oral ivermectin administered in two doses one week apart was associated with a significant reduction in treatment failure compared with a single dose.<sup>8</sup> A report of a case series from the SARS-CoV-2 pandemic found a treatment failure rate with permethrin of 73%. However, all patients responded to treatment with oral ivermectin.<sup>9</sup> One of the possible explanations for treatment failure is the lack of response or resistance to topical permethrin. On the other hand, subtle changes in drug formulation cannot be ruled out, leading to less efficacy. Combinations of current treatments and trying other topical preparations may be the options to combat the situation.<sup>10</sup>

To combat this epidemic, the International Alliance for the Control of Scabies (IACS) was launched in 2012. It proposed some criteria to guide the diagnosis of scabies. Subsequently, the World Health Organization classified scabies as a neglected tropical disease in 2017 and currently collaborates

with organisms such as the IACS to develop joint control strategies. In 2020, scabies was included in the roadmap of the World Health Organization for neglected tropical diseases 2021–2030.<sup>11</sup>

Proposed reasons that could explain why scabies treatment failure is increasing:<sup>12</sup>

1. Incorrect application or regimens and reinfestation.
2. Decrease in sensitivity to topical treatment.
3. Transmission between animals and humans
4. Residual pruritus: a false therapeutic failure.

It is noteworthy that many patients attend once again a few days after the end of the first treatment due to persistent papules and itching claiming a misdiagnosis or unsuccessful treatment. It is important to remember that pruritus, or some papules can last for another 4 and 6 weeks after the end of treatment, even after the infestation has been eradicated. So, therapeutic failure in clinical practice may be multifactorial - due to application errors, resistance to treatments, presence of poorly identified routes and transmission, and even itching due to immunological reactions to scabies antigen and because of false failures due to residual clinical symptoms.

Studies are ongoing to find out the reasons for treatment failure addressing the susceptibility of mites, genetic typing of mites and finding newer molecules to mitigate the situation. Hope, the pandemic will be over very soon from Bangladesh and other parts of the world with new lights of approaches to mitigate the situation.

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