

CASE REPORT

## Scabies in a 2-month-old Infant Successfully Treated with Lindane

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Diagnosis of scabies in young children can be challenging since the morphology and distribution of skin lesions may differ from adults. Therefore, clinicians should keep scabies in mind in their differential diagnosis in a child who presents with severe pruritic, polymorphic skin lesions. Regarding the treatment of scabies, the reported clinical experience with gamma benzene hexachloride (lindane) in young children is quite limited because of its neurotoxicity. However, a recent review suggests that lindane is an excellent alternative drug with minimal risk. We report the case of a 2-month-old male infant with pruritic, erythematous macules, papules, nodules, vesicles, and pustules from the top of the head to the tip of the toes. Initially, he was thought to have impetigo and antibiotics were prescribed. After obtaining a careful history and with the use of skin scraping, he was diagnosed with scabies. He was successfully treated with lindane with no adverse reactions. (*Ann Dermatol* 21(2) 200~202, 2009)

**-Keywords-**

Infant, Lindane, Scabies

### INTRODUCTION

The topical scabicides presently recommended as therapeutic agents include 5% permethrin and 1% lindane. Although 5% permethrin is preferred for the treatment of scabies because of its low toxicity, gamma benzene hexachloride (lindane) is still widely prescribed because of its easy availability. Nevertheless, the potential neurotoxi-

city of lindane, especially for young children with repeated applications, has limited its use<sup>1</sup>. A recent review has concluded that the risk of lindane neurotoxicity is minimal if used properly. We report the case of a 2-month-old infant who was diagnosed with scabies and successfully treated with lindane without any adverse effects.

### CASE REPORT

A 2-month-old male infant presented in August (the summer season in Korea) with small, erythematous macules, papules, nodules, vesicles/bullae, and pustules, some of which were excoriated and surmounted by blood crusts. The distribution of the lesions involved the whole body area, including the face, neck, trunk, palms, and soles (Fig. 1). The excoriated papules and nodules on the infant's hands and fingers were peculiar (Fig. 2). Although the patient had pruritus and thus kept rubbing the lesions, he did not show any signs of systemic toxicity or laboratory abnormalities. He had been admitted to the pe-



**Fig. 1.** The lesions involved the entire body area, including the face, neck, trunk, palms, and soles.

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**Fig. 2.** Conspicuous crusted and excoriated nodules on the infant's hands and fingers.

diatric department under the impression of impetigo contagiosa, and was administered cefazolin intravenously and fusidic acid topically. Despite treatment for 5 days, the skin lesions were getting worse, yet he did not show any systemic symptoms. So, our department was consulted to evaluate his skin manifestations. Based on a careful history and after the microscopic detection of one adult scabies mite and some eggs using the skin scraping method from several vesicles, pustules, and papules on his hands and feet, the diagnosis of scabies was established. According to his mother, the baby's father had visited his hometown in the countryside for several days, 2 weeks prior to the appearance of the skin lesions on the baby. His father was said to also have several pruritic skin eruptions on his abdomen, but the symptoms were tolerable so he did not seek medical attention. After breastfeeding the baby, his mother began to have a pruritic sensation and some small papules on her chest. There was no baby sitter or recent visitors, and there was no one who had been diagnosed with scabies at the hospital where he was born. He was treated with topical lindane once weekly. We recommended that his parents apply the drug at night time and then wash it off the next morning, with the caution that they should avoid application periods  $>6\sim8$  hours or shorter repeated applications. The lesions subsided substantially after 3 weeks without relapse. There were no neurologic events, including seizures, irritability, or any abnormal movements. All household members were treated simultaneously as well.

## DISCUSSION

An infant can exhibit erythematous macules, papules, vesicles/bullae, and pustules due to many different causes. In our case, the baby manifested macules, papules, vesi-

cles, and crusted pustules at the same time. The differential diagnosis included varicella-zoster, other viral exanthema, impetigo, folliculitis, infantile seborrheic dermatitis, and Letterer-Siwe disease. We speculate that the pediatrician thought it was an infectious disease because infectious skin diseases, including impetigo, are common in children, especially during the summer season. In temperate climates, scabies is more common in the winter than in the summer because mites can survive longer on fomites in colder temperatures and thus do not need the close level of contact necessary for transmission<sup>2</sup>.

Typical manifestations of scabies in infants are different from adults. With respect to scabies, infants are more likely to develop vesicles, pustules, and crusting than older children or adults<sup>3</sup>. Young children and infants often show heavy involvement of the palms and soles and all aspects of the fingers, and may even show evidence of mites under the nail plates. In addition, the face and scalp area may also be involved, which are usually spared in older children and adults. On the other hand, lesions in children are usually more inflammatory than in adults and are often vesicular or bullous<sup>4</sup>. Though scabies in young children are different from adults, the combination of a pruritic eruption with characteristic manifestations, and family involvement are usually sufficient to establish the diagnosis<sup>5</sup>. In the present case, the relevant family history and detection of a scabies mite led to the correct diagnosis, despite the highly varied, polymorphic lesions.

Treatment consists of application of 5% permethrin cream at bedtime to all skin surfaces in infants and from the neck down in older family members; it should be washed off after 8~14 hours. Repeated applications may be needed, as the failure rate is significant. Ten to twenty percent of patients require retreatment in 7~10 days. An alternative therapy for newborns is the application of 5% to 10% precipitated sulfur in petrolatum<sup>6</sup>. Permethrin has less neurotoxicity than lindane, particularly in children, and is therefore preferred in North America. Thus, despite its higher cost, 5% permethrin is recommended by the Center for Drug Evaluation and Research (CDER) in the USA as first-line topical therapy for scabies<sup>7</sup>. However, in the largest trial, there was no difference in clinical cure rates at an average of 28 days after treatment; specifically, complete resolution had occurred in 181 of 199 patients treated with permethrin (91%) and in 176 of 205 patients treated with lindane (86%)<sup>8</sup>.

In Korea, permethrin cream is not available commercially. Crotamiton is another alternative for scabies treatment. The efficacy of crotamiton against scabies, however, is low<sup>9,10</sup>. Since in our hospital the only scabicide that can be prescribed is lindane, we treated the patient with it.

**Table 1.** Precautions for the use of lindane<sup>13</sup>

1. Application immediately after a hot bath or on wet skin should be avoided as epidermal hydration and vasodilatation facilitates its absorption.
2. Longer application periods than recommended should be avoided as a 6-hour application period is as effective as longer periods.
3. Repeated applications within a short span of time should be avoided as frequent applications may lead to cumulative toxicity.
4. Oils or oil-based preparations should not be simultaneously used as these increase lindane absorption.
5. Thumb sucking and licking in children after application should not be allowed as oral ingestion increases the systemic levels of lindane.
6. Extreme caution should be exercised in predisposing situations like infancy, childhood, pregnancy, weight < 50 kg, massively excoriated skin, epidermal barrier dysfunction (e.g., atopic dermatitis, psoriasis, and ichthyosis), and malnourishment.
7. Lindane is contraindicated in all neonates, children with a history of seizures, and in adults with known seizure disorders.

We educated the parents to wash it off in about 7 hours and to repeat the application in 1 week.

Lindane is a powerful insecticide and parasiticide with a rapid action against the majority of external parasites, including *Pediculus humanus*, *Phthirus pubis*, and *Sarcoptes scabiei*<sup>11</sup>. Lindane appears to have similar efficacy to permethrin, but is known to be more toxic. In fact, lindane should not be used in infants and small children < 3 years of age because of the risk of systemic toxicity (dose-related seizures and even death)<sup>8</sup>. However, most of the adverse effects are encountered when it is not used properly according to the recommendations. Between 1960 and 1977, there were only 26 case reports of 1% lindane toxicity, despite its extensive use in more than 24 million applications in a period of 17 years in the USA<sup>12</sup>. All three deaths which have been confirmed to be due to lindane use were because of the manner not in accordance with the product label, including multiple topical applications or oral ingestion<sup>7</sup>. Hence, a recent review concluded that the risk of lindane neurotoxicity is minimal, even in infants, if used properly and strictly according to the prescribed recommendations. Various recommendations regarding lindane's use in scabies have been proposed to minimize the potential risks. Some precautions are quoted from a review article (Table 1)<sup>13</sup>.

Our case presented with inflammatory macular, papular, vesicular, and bullous lesions on the whole body, including the head and neck area. In the Korean dermatologic literature, this is the youngest patient diagnosed with scabies. There is a reported case in a 3-month-old male baby. He had erythematous nodules on the trunk, groin, scrotum, and scalp. He was treated with 10% crotamiton for 5 consecutive days<sup>14</sup>. Although lindane has been associated with several cases of neurotoxicity, strict adherence to prescription recommendations and precautions can further safeguard the use of lindane as an alternative drug for young children, especially in a country that does not have 5% permethrin, such as Korea<sup>13</sup>.

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