

# The Comparison of Oral Ivermectin and Topical Lindane in the Treatment of Scabies

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## Abstract

**Background:** Scabies is a common skin disease and a public health problem. The topical antiscabietics have a poor compliance. The aim of this study was to compare the efficacy of oral Ivermectin with topical Lindane solution in the treatment of scabies.

**Methods:** This was a prospective comparative open study. Fifty seven patients were randomized in two groups. One group (32 patients) received 200µg/kg body weight of Ivermectin in two oral doses with a one-week interval, and the second group, (25 patients) received 2 consecutive weekly topical applications of Lindane. All patients were followed up for 2 weeks.

**Results:** A single oral dose of Ivermectin cured 72% of patients and 91% of the patients were cured after the second dose. Two applications of Lindane with a one-week interval cured 92% of cases.

**Conclusion:** Compared to topical Lindane in the treatment of scabies, Ivermectin was at least as effective as Lindane. (*Iran J Dermatol* 2008;11: 147-150)

**Keywords:** antiscabietics, ivermectin, Lindane

## Introduction

Scabies is a highly contagious parasitic disorder characterized by intense nocturnal itching and cutaneous eruption.<sup>1</sup> It is a common and worldwide disease and affects all races and social classes in any age group with no specific gender predisposition.<sup>1</sup> It is of profound public health interest<sup>1,2</sup> because certain environment factors such as overcrowding, poor hygiene, and delayed treatment of primary cases are conducive to its spread.<sup>1</sup> However, prompt and adequate therapy is rewarding and prevents further spreading. It usually transmitted by close physical and sexual contacts.<sup>3,4</sup> There are about 300 million cases of scabies in the world each year.<sup>4</sup> And it is necessary that all general practitioners and dermatologists to be familiar with various clinical manifestation of this disease and look for the latest and most effective treatments. At the time of the study, Lindane 1% lotion was the most commonly used scabicide in Iran. It was available in all pharmacies but other antiscabies drugs were scarce or unavailable. Routine application of Lindane is 2 overnight applications with a one-week interval between them. Control programs currently rely on head-to-toe application of medications, with particular attention to body crevices and genital areas.

Accomplishing this on a community level, or in institutions, is difficult since the treatments need to be administered simultaneously to large numbers of patients to avoid reinfestation<sup>5</sup>. Some people may refuse to participate because they do not believe they have scabies or are reluctant to admit it.<sup>5</sup> Oral Ivermectin is the most recently developed treatment for scabies. Ivermectin is simpler to use and, therefore, is a promising tool to improve compliance and to control infestations,<sup>3</sup> so we decided to evaluate the efficacy of Ivermectin in patients with scabies in the city of Ahvaz, south of Iran.

## Patients and Methods

This prospective comparative open study included 57 patients with scabies attending the dermatology outpatient department of Imam Khomeini Hospital of Jondishapour medical university of Ahvaz during the first 6 months of 1380 (2001). All patients and their family contacts were examined. The clinical diagnosis of scabies was confirmed by the demonstration of eggs, larva, or mites by light microscopy in the material taken by scrapings of burrows. Written informed consent was obtained from all participants. The patients were alternately assigned in two groups but family

members were allocated to the same group. One group received 2 supervised oral doses of ivermectin 200 µg/kg body weight with a one-week interval between doses, and the other group received 2 applications of topical Lindane 1% solution with a one-week interval between applications. Asymptomatic contacts were also treated but not enrolled. Subjects in both groups were instructed to wash their clothing and bed linens in a washing machine or in hot water. The investigator was not blinded to the treatment group assignment. All patients were examined clinically and suspected skin lesions were evaluated by scrapings and light microscopy at each visit and at the end of the second week after the last treatment session. Cure criteria included absence of nocturnal itching, improvement of skin lesions with no new lesions, and negative microscopic examination of suspected lesions. Statistical analysis was done using SPSS13 for windows and differences in proportions were compared with Fisher's exact test, p values < 0.05 were defined as significant.

Inclusion criteria were:

- Clinical diagnosis.
- Positive direct smear on light microscopy.
- No evidence of systemic diseases.
- No use of antiscabies therapy in the last 4 weeks.
- No pregnant or breast-feeding women.
- Adult and children weighting over 15 kg.

## Results

A total of 57 patients were enrolled in the study with a mean age of 26.6 years (range: 11–55 years); 41 patients were male and 16 patients were female, and all completed the study. 32 patients were in the ivermectin group and 25 in the Lindane group. Family history of itching was positive in 70% of patients (78% in ivermectin group and 60% in Lindane group). The demographics of patients and their response to

treatment are shown in table 1. The Fisher's exact test did not show any differences in response between 2 groups (P value = 1).

## Discussion

Scabies is a common, highly pruritic infestation of the skin caused by *Sarcoptes scabiei* var. *Hominis*. It is a very contagious parasitosis and spreads through close personal contact (relatives, sexual partners, schoolchildren, chronically ill patients and crowded communities)<sup>3</sup> and affects all races and social classes in any age group with no specific gender predisposition.<sup>1</sup> It is of profound public health interest in the world<sup>2</sup> especially in undeveloped countries. There are about 300 million cases of scabies in the world each year.<sup>4</sup> Scabies is a also common skin disease in Iran. It is important that dermatologists be familiar with various clinical Presentations and the latest treatments.

Once diagnosed, it must be soon and adequately treated in order to prevent its spread to others. The standard treatment for scabies has long been based on topical scabicides such as Lindane, Permethrin, benzyl benzoate, etc. that must remain on the affected areas for a certain period of time and then be washed off. Multiple treatments over the entire body surface may be required. Application of topical agents from neck to toes is unpleasant. It may be difficult to comply with these requirements in large institutions or in areas where access to a water supply is limited. So looking for a new, safe, effective and easy to use alternative to topical agents is necessary.

Oral ivermectin is the most recently developed treatment for scabies.<sup>3</sup> Ivermectin is a semi-synthetic derivative of a family of macrocyclic lactones. This drug has a broad-spectrum anti-parasitic effect against various nematodes and ectoparasites.<sup>6</sup> Onchocerciasis and lymphatic filariasis are common indications. More recently, ivermectin has been recommended for the treatment of strongyloidiasis and scabies.<sup>6</sup> Ivermectin works by selectively

**Table 1:** Demographics and response to treatment in patients with scabies treated with oral ivermectin or topical Lindane

	Ivermectin (N=32)	Lindane (N=25)
Mean age (years)	26.6	27.4
Decrease or complete improvement of itching		
1 week after first treatment	23	13
1 week after second treatment	29	19
2 weeks after second treatment	29	23
Decrease or complete improvement of skin lesions		
1 week after first treatment	18	11
1 week after second treatment	29	22
2 weeks after second treatment	29	22

binding to specific neurotransmitters receptors that function in the peripheral motor synapses of invertebrates, but these same neurotransmitters exist in brains of mammals.<sup>7</sup> Specifically, Ivermectin blocks chemical transmission across the nerve synapses that use glutamate-gated anion channels or gamma-aminobutyric acid-gated chloride channels.<sup>7</sup> They do not affect synapses gated by other transmitter substances, such as acetylcholine, norepinephrine, and serotonin.<sup>7</sup> In humans (unlike invertebrates), gamma-aminobutyric acid and glutamate do not affect peripheral motor function. This is the reason why invertebrates are selectively paralyzed by the drug.<sup>7</sup>

There is warning on the safety of Ivermectin in patients treated for scabies. An increase in the number of deaths within the first 6 months following treatment in the elderly patients has been reported.<sup>8</sup> But Pascal did not find evidence of an increase death rate in elderly patient even after repeated doses.<sup>9</sup> Some authors suggest that in infants, children under 5 years old, and pregnant or lactating women Ivermectin should not be used.<sup>10</sup> But others believe it is safe in children and in pregnancy.<sup>11,12</sup> Oral Ivermectin is an effective, safe, cheap, and convenient drug to administer.<sup>4</sup> It may be particularly useful in the treatment of scabies outbreaks in institutions, especially for elderly people in nursing homes<sup>4</sup>, severely crusted scabies lesions in immunocompromised patients<sup>10</sup>, infestations in crowded communities or when topical therapy has failed. It is also useful as a simple treatment in the prophylaxis of close contacts.<sup>3</sup> Ivermectin is an easy drug to administer. Ordinarily, it is given as a single oral dose, but two or three oral doses with one-week intervals are also used without any side-effects.<sup>4,13</sup>

We used two doses of ivermectin with a one-week interval. Although we had some hesitations and fears regarding complications, we did not see any complications in our patients. In our study, 72% of the patients were cured at the end of the first week after one dose of ivermectin, and 91% of patients were cured at the end of the 2<sup>nd</sup> weeks after the second dose. In another study in Iran<sup>14</sup>, 100% of patients were cured one week after the second dose of Ivermectin<sup>14</sup> was administered. In a study by Madan, 82.6% of the patients showed improvement four weeks after one oral dose, whereas only 44.44% of their patients in the Lindane group showed a similar response.<sup>15</sup> Ivermectin induced an early and effective improvement in signs and symptoms<sup>15</sup>. In one study, 48 -72 hours after the first dose, decrease or

complete improvement of itching was seen in 83.7% of patients in ivermectin group but only in 47.7% of patients in Lindane group<sup>14</sup>.

In conclusion; ivermectin has several clinical advantages that make it superior to topical treatments. It is safe, inexpensive, simple to administer, easily supervised, and treats the entire skin surface without neglecting any areas<sup>16</sup>, and is better tolerated than topical treatments in those with excoriations or open ulcerations<sup>16</sup>. The drug has successfully been used for mass treatment and in epidemics. It also has the additional benefit of reducing the prevalence of other human parasitic infections common in the tropics, including onchocerciasis, Ascaris infection, lymphatic filariasis, pediculosis, cutaneous larva migrans, and strongyloidiasis<sup>16</sup>.

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