

# Creepy Crawlies and Kids

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Lice and scabies are two topics most people associate with transients, internment camps, and the Middle Ages, but infestations remain reasonably common problems for primary care practitioners. The social stigma attached to these infestations has been such that patients are often reluctant to raise these problems with their caregivers, and, consequently, the diagnosis may be difficult and delayed.

Over the past several years, the issue of mosquito control has become much more controversial. The potential risks of exposure to known, effective mosquito-repellant agents need to be balanced against the risk of mosquito-borne disease.

## *How do I treat for scabies?*

Scabies is very common, and there are an estimated 300 million annual cases worldwide. The two groups at highest risk for scabies are young children and their families, and patients in nursing homes. The children at highest risk are children under two, followed by their mothers, and older female siblings.

Clinically, scabies is characterized by skin lesions with the hallmark being intense pruritis, especially at night. Usually, the lesions of scabies are initially small papules, which can develop a crusty or scaly appearance over time. The lesions tend to be in the warmer parts of the body except in young children, in whom cutaneous manifestations can be seen over the whole body. Scabietic burrows can be seen in the webs of the hands

## Mary's rash

Mary, 11, presents with a one-week history of increasingly severe, pruritic rash. On examination, you make the diagnosis of scabies.

### **What therapy will you prescribe?**

While learning Mary's medical history, her mother expresses concern to the risk of West Nile virus to Mary when she and her friends are out playing soccer. Recently, there have been several cases locally.

### **What do you recommend?**

**For the answers, see page 98.**



and feet; these may be more common in adults than in children.

The therapy for scabies has historically relied on the use of preparations based on lindane, typically in a 1% concentration (1% added). The preparation was applied body-wide, and washed off in the morning after an eight- to 12-hour treatment. However, lindane is potentially neurotoxic, and there are case reports of seizures among infants and small children treated with lindane. Consequently, lindane treatment has fallen out of favour in comparison to other agents which are believed to have less potential for neurotoxicity. In other countries, benzyl benzoate and malathion have been used to treat scabies.

# Demonstrated effective here.



## Lipidil SUPRA™ Demonstrated effective in raising low HDL in patients with type 2 diabetes.<sup>1</sup>

\* The diagnosis of the metabolic syndrome is made when 3 or more of the following risk determinants are present: abdominal obesity, elevated triglycerides, low HDL cholesterol, raised blood pressure and elevated fasting glucose.<sup>‡</sup>

† Double-blind, placebo-controlled, cross-over trial of 11 men with the metabolic syndrome. Subjects were randomized to a 5-week treatment period of either micronized fenofibrate (200 mg/day), atorvastatin (40 mg/day) or placebo. Baseline HDL levels for the fenofibrate group were 0.94 mmol/L,  $p < 0.001$  for micronized fenofibrate vs. placebo for change in HDL.

‡ After a six-week dietary run-in phase, 37 males eligible on lipid criteria including total cholesterol  $\geq 6.5$  mmol/L, or TG  $\geq 2.0$  mmol/L, or HDL  $< 0.9$  mmol/L and at least 2 of the metabolic syndrome components entered a twelve-week treatment phase consisting of diet plus 200 mg/day of micronized fenofibrate. The study was open-label. Baseline HDL levels for the fenofibrate group were 1.15 mmol/L,  $p < 0.01$  for micronized fenofibrate vs. baseline.

Lipidil SUPRA™ is indicated as an adjunct to diet, at least equivalent to the Adults Treatment Panel (ATP III) and Therapeutic lifestyle changes (TLC) diet, and other therapeutic measures when the response to diet and other measures has been inadequate for: 1) Treatment of patients, including patients with type 2 diabetes (non-insulin dependent), with dyslipoproteinemia (hypercholesterolemia, Fredrickson classification Types IIa and IIb mixed hyperlipidemia), to regulate lipid levels by reducing serum TG and LDL cholesterol levels and increasing HDL cholesterol; 2) Treatment of adult patients with very high serum TG levels, Fredrickson classification Type IV and Type V hyperlipidemia, who are at high risk of sequelae and complications (i.e., pancreatitis) from their hyperlipidemia. Lipidil SUPRA™ alone may not be adequate therapy in some patients with familial combined hyperlipidemia with Type IIb and Type IV hyperlipoproteinemia. Lipidil SUPRA™ is not indicated for the treatment of Type I hyperlipoproteinemia.

...cont'd opposite

Currently, topical preparations with 5% permethrin are considered the therapy of choice for scabies. The preparation should be applied body-wide in the evening, and washed off in the morning. It should be noted that a second application may be necessary in seven to 10 days. The only common adverse effect to topical permethrin is mild burning or stinging. Most of the new therapies for scabies include permethrin as the active ingredient.

Therapeutic issues include the control of pruritis, decontamination, and therapeutic failure. Pruritis may persist for some time after topical therapy. Antihistamines may be helpful in management, especially when pruritis is interfering with sleep. Corticosteroids have been used in very severe cases, but this remains largely unproven and should be reserved for severe cases that are unresponsive to antihistamines. Treatment of other family members, notably children who are in the same age range, may be necessary. Also, bed linen should be decontaminated by washing in hot water. If washing or dry cleaning is not possible, then items may be stored for two weeks in a sealed, air-tight plastic bag, after which they can be re-used. It should be noted that *Sarcoptes scabiei* is a human pathogen, and does not spread from humans to pets or vice versa. Pets with mites are infested with a different species, and, while they can cause a temporary infestation in humans associated with pruritis and dermatitis, they do not reproduce on a human host.



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Figure 1. A magnified look at a head louse.

Therapeutic failure is an increasing problem, and can be due to a number of different reasons. As noted above, treatment failure can be due to re-infection from other family members who have not been treated. Treatment failure can also be due to re-infection from bed linen which has not been decontaminated. Finally, treatment failure may be due to infection with resistant strains. Re-treatment is useful when failure is due to re-infestation. However, when resistant infestations occur, options are somewhat limited. One option is to use lindane-containing preparations or other older treatments, such as sulphur-containing ointments or crotamiton cream. A second option is to have the patient covered in a thin layer of petroleum jelly overnight to asphyxiate the mites. A third option is a single oral treatment of ivermectin. Currently, ivermectin is only available in Canada as a veterinary product, and there is no pediatric liquid preparation available. A study of ivermectin use in a nursing home with a troublesome infestation demonstrated that a single oral dose was more effective than topical therapy. Although there was a cluster of unexpected deaths in the elderly patients treated with ivermectin, detailed analysis does not suggest this was related to ivermectin therapy.

And here.



**Lipidil SUPRA™.**  
**Demonstrated effective**  
**in raising low HDL**  
**in patients with**  
**the metabolic syndrome.†,‡,2,3**

Strict birth control procedures must be exercised by women of childbearing potential; if pregnancy occurs despite these procedures, Lipidil SUPRA™ should be discontinued. Women planning pregnancy should discontinue Lipidil SUPRA™ several months prior to conception.

Abnormal liver function tests are observed occasionally during fenofibrate administration, including elevations of transaminases and decreases, or rarely, increases in alkaline phosphatase. However, these abnormalities disappear when therapy with fenofibrate is discontinued. Periodic liver function tests in addition to other baseline tests are recommended after 3 to 6 months and at least yearly thereafter.

The most commonly reported adverse events associated with fenofibrate are gastrointestinal disorders, abdominal pain and increased AST (>3 x UNL) (all at 1.1%).

In patients with renal insufficiency (creatinine clearance between 20 and 100 ml/min), Lipidil SUPRA™ treatment should be initiated at 100 mg/day and increased only after evaluation of the tolerance and effects on the lipid parameters. Lipidil SUPRA™ should not be used when the creatinine clearance is lower than 20 ml/min.



fenofibrate microcoated formulation

**BECAUSE HIGHER HDL IS BETTER HDL.**



## Scabies, Lice, and Mosquitoes

### How do I treat for head lice?

Head lice or *pediculus capitis* (Figure 1) is a common, and often very annoying, problem which carries a significant stigma.

Head lice infestation is often asymptomatic, and is diagnosed by the presence of eggs on the shafts of hair. The life cycle of lice involves dwelling on the shaft of the hair and moving to the scalp to feed. Interestingly, recent work has suggested that not all people with eggs on their hair will have an infestation. However, it would still be considered reasonable to treat patients who present with eggs on shafts of hair as if they were infested.

Therapy for head lice typically uses one of four different classes of agents (Table 1). Permethrin-containing products are commonly used. The patient should remove clothing from the waist up, then have the product applied to hair. Patients should take care not to use cream rinse or combination shampoo/conditioner products before being treated for head lice. Extra long hair may require additional pediculicide cream. The patient should then put on clean clothing, and the hair should not be washed for 24 hours. After

eight to 12 hours, lice and eggs should be removed using a fine comb. If the lice are moving slower than normal, this should not be regarded as a therapeutic failure. Nymphs may hatch up to a week after therapy, so a second course of therapy seven days later is recommended.

Decontamination of clothing and bed linens is important. The steps taken with respect to scabies should be performed with head lice (washing in hot water, dry cleaning or sealing in air-tight plastic bags for two weeks). Other family members should be checked. Head lice are somewhat fastidious and will not live on household pets.

However, if there are active lice in the hair 12 to 14 hours after treatment, then this represents a treatment failure. Therapeutic failure can occur via several mechanisms. As mentioned, re-infestation from nymphs which have hatched since the treatment may re-infest the patient. As well, permethrin-resistant strains have been described, with resistance to therapy apparently related to specific mutations. In the case of permethrin-resistant lice, a recent study has demonstrated that these lice are sensitive to the organophosphate malathion. As in the case of scabies, ivermectin appears to be effective in resistant cases. There are significant restrictions to the use of ivermectin, and it should only be used in the most severe cases under the guidance of a specialist.

There are a number of herbal remedies which are used for the therapy of head lice, often containing oils or combinations of oils. There are numerous anecdotal reports of efficacy, but there are few controlled studies of these products. One product that is widely used in Canada is tea tree oil. Tea tree oil has been recommended for use in shampoo between treatments to prevent eggs from establishing themselves on the hair shaft. Typically, tea tree oil is used in a concentration of 10 drops per 750 mL bottle of shampoo. In this concentration, it is likely to be safe. However, parents should be advised to avoid apply-

### Answers for Mary

To treat Mary's scabies, I would use a 5% permethrin cream. The cream should be applied body-wide at night, and washed off the next morning. I would also recommend the use of a systemic antihistamine, such as chlorpheniramine or diphenhydramine, for control of pruritis and decontamination of the bed linen.

With respect to the risk of West Nile virus, the first thing to consider is mosquito avoidance techniques, such as wearing long-sleeved clothing, and avoiding the outdoors at dusk and at other mosquito-rich times. It would be appropriate to apply an insect repellent containing N,N-diethyl-meta-toluamide (DEET) to Mary prior to her soccer games. Given Mary's age, it would be reasonable to repeat the application if she will be outside for more than a few hours.

## *Scabies, Lice, and Mosquitoes*

ing undiluted tea tree oil directly onto their child's scalp, as it can cause an irritant dermatitis.

### *What about mosquito avoidance?*

The humble mosquito has been a vector for human disease for thousands of years. A number of products have been developed to repel mosquitos. The most effective known insecticide is N,N-diethyl-metotoluamide (DEET), which is used topically in concentrations ranging from 5% to 100%. The efficacy of DEET has been established in a number of studies, with the duration of protection being concentration-dependent; a 30% solution provides six hours of protection from mosquito stings, while a 10% concentration provides three hours of protection. However, this effect reaches a plateau at about a 50% concentration, and Health Canada has ordered that all products containing more than 30% DEET be phased out after December 2004.

DEET has produced significant adverse effects in adults who have ingested it, with seizures and neurotoxicity being prominent components of DEET toxicity. The actual experience with DEET toxicity in children is much more limited, with only about 10 case reports in the literature describing seizures associated with DEET exposure. A recent large study has demonstrated that infants and children may in fact be more resistant to the undesired effects of DEET than adults.

Concerns with respect to DEET continue, and are accompanied by increasing worry about mosquito-borne disease. While there

has been a constant low level of transmission of viral encephalitis by mosquitoes, the recent arrival of the West Nile Virus in North America has heightened concerns with respect to mosquito-borne disease. As the West Nile Virus has moved north and west from the Atlantic seaboard, cases have been reported across Canada. Given Canada's large and robust insect population, this is an issue of major public concern. Thus, there has been a search for alternatives to DEET in reducing the risk of mosquito stings. A recent comparison has demonstrated that DEET-based insect repellents remain superior in efficacy to their non-DEET based equivalents.

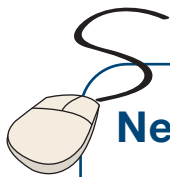
When the literature is reviewed critically, DEET appears to be both effective and relatively safe when used for reducing the risk of mosquito stings in infants and children. A recent expert commentary has reviewed the recommendations of the Canadian Pediatric Society and Health Canada. These recommendations suggest that DEET should not be used in infants under six months. Furthermore, when used in children six months to two years, DEET should be limited to one application per day. It is also recom-



## Scabies, Lice, and Mosquitoes

mended that children two to 12 years should be limited to two applications per day. However, as noted by the authors of the commentary, this may not cover an extended period of time outdoors, or a child who has been swimming, as DEET will be washed away. Thus, if the child is in an area where West Nile Virus is prevalent, an additional application would be reasonable if the child is outdoors for more than four hours, or after swimming. CME

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### Net Readings

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2. Headlice.org [www.headlice.org](http://www.headlice.org)

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## Take-home message



- The medication of choice for scabies is a topical preparation with 5% permethrin. One must remember to decontaminate clothes and linens, as well as to check other family members since they may be the reason for therapeutic failure.
- Lice is very common and can be treated using one of four classes of agents: pyretherins, synthetic pyretherins, organophosphates, and herbal products, such as tea tree oil.
- The most effective way to avoid mosquito bites is with DEET. However, before application, one must consider DEET concentration, as well as the age of the person using it.

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