

Letters

Head lice resistant to pyrethroid insecticides in Britain

EDITOR,--Recent anecdotal reports and one clinical study have suggested that head lice found in parts of Israel and France have acquired resistance to the pyrethroid insecticides permethrin and phenothrin.*RF 1, 2, 3* In Britain most failures of treatment reported to us have been attributable to causes other than resistance, including shorter than expected residual protection after treatment with permethrin. When working in north London in January 1994 we obtained lice and hair samples from children whose families had obtained pyrethroid products from more than one country and used them regularly and recently. In the laboratory the lice lived normally in contact with the treated hairs, but laboratory bred clothing lice, which were susceptible to insecticide, died within two hours. Later batches of head lice from the same source were exposed to filter papers that had been treated with 0.1% (6.3 $\mu\text{g}/\text{cm}^2$) or 0.25% (15.75 $\mu\text{g}/\text{cm}^2$) permethrin. The table shows the numbers able to survive further exposure and to feed normally. No published studies exist of the sensitivity of head lice in Britain before pyrethroid insecticides were introduced. Studies performed in Israel before permethrin was introduced there show, however, that the exposure time required to kill 50% and 95% of laboratory bred clothing lice when the World Health Organisation's standard test papers were used was 45 and 75 minutes respectively.⁴ For head lice collected in the field the figures were 90 and 180 minutes, which means that double the dose was required. For our laboratory bred clothing lice the figures were 59 and 120 minutes when papers impregnated with permethrin 6.3 $\mu\text{g}/\text{cm}^2$ were used. By contrast, the head lice that survived overnight remained viable with regular blood feeds for up to 72 hours, indicating at least a 16-fold increase in resistance

Head lice with at least a 20-fold increased tolerance to permethrin or phenothrin, or both, have been collected subsequently from the health authority areas covering Cambridge, Dorset, Greenwich, Northamptonshire, and the weald of Kent. This low resistance seems to have developed simultaneously and independently in geographically separate populations of British head lice within four years of the introduction of pyrethroid insecticides on to the market.

Many districts that have recommended pyrethroid insecticides are now changing to other preparations as part of their routine rotation policy. This should help eliminate problems. Nevertheless, effective treatment can be achieved if sufficient product is applied carefully in areas of resistance. We recommend two applications of at least 50 ml one week apart. Carers should check for surviving lice or newly hatched nymphs between treatments and for one week after, using a plastic detection comb.

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1. Siegel J. Head lice now resistant to most popular commercial preparations. *Jerusalem Post* 1994 Sept 12:1.
 2. Combescot C. Epidemiologie actuelle de la pediculose a *Pediculus capitis*. *Bull Acad Natl Med* 1990;174:231-7. [[Medline](#)]
 3. Chosidow O, Chastang C, Brue C, Bouvet E, Izri M, Monteny N, et al. Controlled study of malathion and d-phenothrin lotions for *Pediculus humanus var capitis*-infested schoolchildren. *Lancet* 1994;344:1724-7. [[Medline](#)]
 4. Mumcuoglu KY, Miller J, Galun R. Susceptibility of the human head and body louse, *Pediculus humanus* (Anoplura: Pediculidae) to insecticides. *Insect Science and Its Application* 1990;11:223-6.

Survival of head lice exposed to filter papers treated with permethrin

No (%) of lice:

Date when lice collected	Treatment and dose	Total lice collected	Able to feed after 24h	Surviving >48 h
Oct 1994	Permethrin 6.3 $\mu\text{g}/\text{cm}^2$	55	17 (31)	15 (27)
Jan 1995	Untreated	31	14 (45)	14 (45)
Jan 1995	Permethrin 6.3 $\mu\text{g}/\text{cm}^2$	69	35 (51)	33 (48)
Mar 1995	Untreated	27	12 (44)	12 (44)
Mar 1995	Permethrin 15.8 $\mu\text{g}/\text{cm}^2$	31	14 (45)	12 (39)