

What is already known on this topic

Head lice have varying degrees of resistance to over the counter pediculicides

Fine tooth combing of wet hair is an effective method of detecting head lice but unproved as a treatment

What this study adds

Effectiveness of popular over the counter pediculicides for eliminating head lice is poor

The *kdr*-type resistance mechanism to pyrethroids is widespread in head lice in the United Kingdom

The Bug Buster kit is significantly more effective than common over the counter pediculicides for normal unsupervised use

Finally, the discrepancy may also be due to differences in resistance to insecticide, as our trial was carried out after the Welsh trial and included a range of urban settings. The particularly poor effectiveness of permethrin is likely to be due to widespread *kdr*-type resistance; all but one of the lice from treatment failures collected in this study were found to have the T929I and L932F resistant genotype mutations of the paratype sodium channel gene (MSW, unpublished data). On the basis of these and earlier similar findings we believe that the status of licensed insecticide treatments needs to be assessed as they potentially expose users to repeat applications without any important reduction in infestations.

The updated Bug Buster kit seems to provide a viable alternative to over the counter insecticide treatments.

Some may consider that the cure rate of only 57% we detected with the Bug Buster kit is still unacceptable and may not provide an efficient treatment against head lice. At present there are no readily available products that provide fully effective control of head lice, and there is an urgent need to identify safe, novel insecticides of proved efficacy.

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Competing interests: NH has received funding over the past 10 years to screen pediculicides but not products or companies involved in this study.

Ethical approval: London School of Hygiene and Tropical Medicine research ethics committee, London multicentre research ethics committee, and individual local research ethics committees of the health authorities in each study area.

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A memorable patient

A late diagnosis

An 82 year old man was taken to casualty after being in a car crash. He had a fractured sternum but had no neck pain, and his cervical spine was cleared clinically. Over the next few days, however, he developed neck discomfort, mild weakness of his right hand, and intermittent paraesthesiae of his fingers. He mentioned these symptoms several weeks later in a follow-up clinic for the sternal fracture. Examination revealed kyphosis of the lower cervical spine, no tenderness, and a moderate range of movement. There was mild weakness of the right C6 and C7 myotomes, but normal sensation and no sign of myelopathy. He denied any previous neck problems.

Radiographs showed a 50% spondylolisthesis at C6-7; the right facet joint had dislocated and the left was subluxed. Magnetic resonance imaging showed mild deviation and indentation of the spinal cord from canal stenosis but no cord oedema. Computed tomography revealed a fractured posterior arch of C6, which seemed old, and a reduced anteroposterior diameter of the canal. The C6-7 disc space was degenerate with cystic changes in the vertebral bodies, confirming that the injury occurred some time ago.

We asked the patient if he could remember any possible injury to his neck. The only event to which he could ascribe the injury

was during the second world war, when he was an engineer in a Lancaster bomber. In 1943 his plane was shot down by night fighters, and he and four other surviving crew bailed out over enemy territory. He remembers only that the parachute gave him a severe jolt when it deployed. He was captured and, for the first two weeks, was held prisoner in northern Germany in a small cell with only a straw mattress bed. He recalls having a stiff neck for several days but received no medical attention. Apart from daily interrogation, he lay on the mattress for nearly 24 hours a day.

He could not recall having any trouble with his neck since then, but his son mentioned that he had always noticed his father's rather sway posture and his daughter reminded him that he often used to mention having a stiff neck and was always rubbing it.

Cervical fractures and dislocations are occasionally missed after inadequate clinical or radiological evaluation. However, it is rare for patients to survive such a serious injury without developing partial or complete paralysis. It is rarer still for them to be unaware of the injury.

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