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**Pyrethroid insecticides linked to abnormal behaviour in children, study shows**

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Ingredients found in head lice and scabies treatment products have been linked to behavioural difficulties in young children, scientists say.

A team of French researchers investigated whether prenatal or childhood exposure to pyrethroid, which is a group of synthetic chemical insecticides, had any impact on neurobehavioural development.

The study, which involved analysing the urine of 287 women while they were pregnant and that of their children six years later, established a link between pyrethroids and behavioural disorders in children.

It found that higher levels of a certain pyrethroid in the urine of the mums-to-be was associated with a heightened risk of "internalising" behaviours in their six-year-olds, such as being anxious and withdrawn.

It also found that levels of a different pyrethroid in the children's urine samples was associated with a greater risk of "externalising" behaviours, such as being defiant and aggressive.

Children with the highest levels were around three times as likely to display abnormal behaviour.

"Identifying the potential causes [of neurodevelopmental deficits] that can be remediated is, therefore, of paramount public health importance," the researchers from University of Rennes and University Hospital in France wrote.

Pyrethroids, which work by damaging the nerves, are found in a wide range of products, including head lice treatments, scabies creams, mosquito repellents and flea control for pets.

An ingredient called permethrin, which is part of the pyrethroid family, is in Johnson&Johnson's 'Lyclear Scabies Cream', iNova's 'Pyrifoam Lice Breaker', and Orion's 'Quellada Headlice Treatment', according to the Therapeutic Goods Administration's (TGA) database.

Whilst Lyclear instructs users to "keep [it] out of reach of children", it also says it can be used on children between six months and two years of age under medical supervision.

Popular insecticide sprays sold at hardware stores, such as Yates, also contain pyrethroids.

The observational study, published in BMJ's*Occupational & Environmental Medicine*, required the 287 mothers to fill in a detailed questionnaire on socioeconomic factors, lifestyle, their child's behaviour, and various environmental exposures.

Psychologists then visited them and their children at home to undertake behavioural assessments, and to collect dust and urine samples for analysis.

They assessed the children's behaviour, focusing particularly on altruism. The researchers believe that pyrethroids might alter neurochemical signalling in the brain.

But a counter-intuitive finding was that high levels of another type of pyrethroid in the children's urine sample was associated with a lowered risk of externalising behaviours.

As an observational study, the researchers didn't establish cause and effect.

Associate Professor Vincent Pettigrove from University of Melbourne said: "These results are very concerning as these chemicals are commonly used in urban areas of Australia, especially for termite control."

Dr David Goddard, from Monash University's Department of Epidemiology an Preventive Medicine, identified some weaknesses in the methodology, including the small size of the group.

"However, because the authors postulate a cellular mechanism for harm and their study subjects are mothers and their child, their findings could have an impact on community sentiment," he said.

"A reasonable public health outcome based on this study would be that exposure to insecticides should not be greater than is required to control their intended pest target, but the study does not provide a firm enough basis to restrict use of pyrethroids."

Professor Ian Rae, a chemicals expert at the University of Melbourne, said the French researchers were "operating near the limits of even modern analytical chemistry" and monitoring substances at concentrations "below the level of detection".

"We are all exposed to them and live with traces in our tiny bodies of as many as several hundred substances produced by the chemical industry and used in domestic, industrial or agricultural settings," he said.

"So, were the pesticides to blame in this case? Who can tell? Even the researchers admit that there could be 'reverse causality', that is, that children with behavioural problems (such as hyperactivity) might be somehow more exposed to pesticides."

TGA is reviewing the new research to determine whether any action is required.

A Johnson&Johnson spokesperson said: "As with all of our medicines, we continuously monitor and welcome the latest scientific research that will improve the safety of our medicines."