

COMMITTEE ON TOXICITY OF CHEMICALS IN FOOD, CONSUMER PRODUCTS AND THE ENVIRONMENT

STATEMENT ON A SYSTEMATIC REVIEW OF THE EPIDEMIOLOGICAL LITERATURE ON PARA-OCCUPATIONAL EXPOSURE TO PESTICIDES AND HEALTH OUTCOMES OTHER THAN CANCER: LAY SUMMARY

1. Following up a recommendation from an earlier statement by the Committees on Toxicity and Carcinogenicity (COT and COC), COT carried out a review of the epidemiological literature on para-occupational exposure to pesticides and health. In this context, para-occupational exposure was defined as exposure which occurs in household members who live with an occupationally exposed worker, but who are not themselves occupationally exposed. Such exposure might occur, for example, when laundering contaminated clothing, or through contact with contaminated surfaces such as taps that have been handled by the exposed worker.
2. The review was restricted to health outcomes other than cancer. Possible risks of cancer were considered in a parallel review conducted by COC¹.
3. A total of 53 relevant published reports were considered by the Committee, covering neurological and mental health, reproductive health, respiratory health, and possible effects on the eye. In addition, a number of studies were identified, which provided information on levels of para-occupational exposure, assessed by measurement of pesticides or their breakdown products in the blood or urine of people living with farmers or pesticide operators. In these investigations, the highest para-occupational exposures were all lower than the highest occupational exposures recorded in the same study.
4. The Committee found that the available epidemiological evidence had major limitations. Most studies had investigated exposure to 'pesticides', or to classes of pesticides, such as insecticides, fungicides or herbicides. These broad categories cover a wide variety of chemical compounds which differ from each other substantially in their toxicology, and which therefore would be expected to have different health effects. Combining diverse compounds in a single exposure category would tend to obscure any adverse effects that they produced. At the same time, in studies where exposures to specific compounds were investigated, the numbers of individuals exposed to any one chemical were small, which again limited ability to detect adverse effects.

¹ Committee on Carcinogenicity of Chemicals in Food Consumer Products and the Environment. Statement on the systematic review of epidemiological literature of para-occupational exposure to pesticides and health outcomes, CC/11/S1
<http://www.iacoc.org.uk/statements/documents/ParaoccupationalpesticideCOCfinalstatement2011Editdwlogo.pdf>

5. In most studies, exposure was self-reported, and in some cases this may have led to bias from errors of recall.
6. Selective publication of studies, or of positive findings within studies, may have distorted the overall balance of evidence in the literature.
7. Where positive findings were reported, they had often emerged from large analyses in which multiple associations between exposures and health outcomes had been explored, with no strong reason to expect the specific associations that were observed. Such findings can be given little weight unless they are confirmed in other independent studies.

CONCLUSIONS

8. The Committee reached the following conclusions.
 - i) Epidemiological studies of para-occupational exposure to pesticides allow investigation of health outcomes that cannot readily be addressed in relation to occupational exposure – for example, possible effects on brain development and allergic disease in children. Moreover, para-occupational exposures may be higher than those that occur in bystanders and residents*, making it easier to detect adverse effects where they occur (because risks will tend to be higher).
 - ii) Despite these theoretical advantages, currently available studies of para-occupational exposure to pesticides are limited in number, scope and design, and do not provide strong pointers to any health hazard, either from broad classes of pesticide or from specific compounds.
 - iii) Most worthy of further investigation are a possible association of miscarriage with para-occupational exposure to fungicides and phenoxy herbicides, and further research on allergic diseases such as asthma and hay fever, in children of farmers who use pesticides. However, studies of pesticides and miscarriage would be better conducted among women with occupational rather than para-occupational exposure, and are more likely to be feasible in countries other than the UK.
9. The review did not point to any pesticides that should be a particular priority for biomonitoring studies in bystanders or residents.

The full COT statement can be found at:

<http://cot.food.gov.uk/pdfs/cotstatementparaocc201105.pdf>

* Bystanders are persons located within or directly adjacent to an area where a plant protection product is being or has recently been applied, and whose presence is incidental and unrelated to work involving pesticides, but whose position may put them at risk of exposure. Residents are persons who live, work or attend school or any other institution adjacent to an area that is being or has been treated with a plant

protection product, and whose presence is incidental and unrelated to work involving pesticides but whose position may put them at risk of exposure.

**Lay Summary to COT Statement 2011/05
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