

This is a draft paper for discussion. It should not be quoted, cited or reproduced.

CC/07/3

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

Draft Working Paper on Prostate Cancer and Pesticide Exposure

At the last meeting, the committee discussed new reviews of prostate cancer and pesticide exposure. Members are asked for comments on this draft statement which incorporates the conclusions of that meeting and updates the 2004 statement on prostate cancer.

Secretariat

February 2007

Draft Working Paper on Prostate Cancer and Pesticide Exposure

Introduction

1. In 2004 we published a statement on prostate cancer, in which we discussed the known and potential risk factors associated with this disease. The statement included an evaluation of the epidemiological and other data on occupational groups and chemical exposures for which an association with prostate cancer has been proposed. Two occupational groups were considered: rubber workers, for whom we concluded that there was no evidence convincing of an increased risk of prostate cancer, and farmers/farm workers/pesticide applicators. In the case of this latter group, we concluded:

“...that there was some limited evidence to suggest an association between farmers/farm workers, exposure to pesticides and increased risk of prostate cancer. The possibility of such an association being causal could not be discounted and the published literature should continue to be monitored for further studies. (We) commented on the need for improved measures of exposure to pesticides and in particular herbicides. It was considered that the potential association between herbicide use by farmers and farm workers should be kept under review”(COC, 2004)

2. Recently, we were asked by the Pesticides Safety Directorate of the Department of the Environment, Food and Rural Affairs (Defra) to consider a report commissioned from the Institute of Occupational Medicine (IOM) entitled “Desk Study on Prostate Cancer and Pesticide Exposure”(IOM, 2006) and to advise on whether the report alters the conclusion of our 2004 statement. At the same time, we considered a newly published review and meta-analysis of cohort studies of prostate cancer risk in pesticide manufacturing workers (Van Maele-Fabry et al, 2006). We report here on our conclusions.

3. The IOM report is a narrative review of the epidemiology of occupational exposure to pesticides and the risk of prostate cancer, and of the potential mechanisms that might underlie any association. The report finds that

This is a draft paper for discussion. It should not be quoted, cited or reproduced.

epidemiological studies of manufacturing workers exposed to pesticides have not reported an excess risk of prostate cancer. It also finds that the large number of studies of agricultural workers exposed to pesticides have been inconsistent: many have been negative or inconclusive, with a few showing positive results. We note that the report proposes that pesticides might cause prostate cancer through a potential endocrine-disrupting mechanism based on androgen imbalance. We are aware of papers which refute this hypothesis but which are not included in the report (refs?). Moreover, pesticides are not a generic group of chemicals but comprise compounds of different structures and biological activities. It is unlikely, therefore, that a single mechanism of action would apply to all pesticides. [We endorse the IOM recommendation for further investigations into the mechanism by which exposure to pesticides may lead to increased prostate cancer risk].

4. The meta-analysis by Van Maele-Fabry et al (2006) was conducted on 16 studies of workers ever employed in pesticide manufacturing and with potential exposure to pesticides. The analysis combined relative risk estimates from both incidence and mortality studies to derive an overall meta-rate ratio of 1.28 (95% CI 1.05 -1.58). After grouping the data into specific chemical classes of pesticide, increased pooled rate ratios were reported for each class but statistically significant results were only reported for accidental and non-accidental exposure to phenoxy herbicides contaminated with polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzofurans. We note that there are some unresolved methodological issues in this analysis, for example, adjustment for confounding might have been unsatisfactory, as little is known about the risk factors for prostate cancer. Nevertheless, the paper is a useful addition to the literature. That the result of this analysis differ from the conclusion of the IOM review is not surprising, as a meta-analysis can result in a conclusion which differs from the individual papers.

5. We consider that the individual studies to date of exposure to pesticides in farmers/farmworkers and in pesticide manufacturing workers provide no consistent support for an association with prostate cancer. A recent meta-analysis by Van Maele-Fabry et al (2006) provides some limited evidence of a weak association between pesticide exposure in manufacturing workers and prostate cancer.

This is a draft paper for discussion. It should not be quoted, cited or reproduced.

Causality cannot be inferred from the available data. We recommend that the literature on this topic continues to be kept under review.

References

Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment. Prostate Cancer. Statement COC/04/S6 – December 2004.

(<http://www.advisorybodies.doh.gov.uk/coc/prostate.htm>)

Institute of Occupational Medicine. Desk study on prostate cancer and pesticide exposure. Research project final report to Defra, 28 February 2006.

(http://www.defra.gov.uk/science/project_data/DocumentLibrary/PS2609/PS26093823_FRP.doc)

Van Maele-Fabry G, Libotte V, Willems J and Lison D (2006). Review and meta-analysis of risk estimates for prostate cancer in pesticide manufacturing workers. *Cancer Causes Control* 17, 353-373.