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The use and disposal of household pesticides

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Abstract

Most pesticides are synthetic chemicals manufactured specifically for their toxic properties to the target species, and widely used globally. Several epidemiological studies in the United States have suggested health concerns arising from the chronic exposure of young children to pesticides in the domestic environment. In the UK very little is currently known about how nonoccupational pesticides are being used or disposed of. Any use of pesticides is a potential risk factor for children's exposure, and any potential exposure is likely to be reduced by the parents' adopting precautionary behaviour when using these pesticide products. This was investigated using a sample of 147 parents from the Avon Longitudinal Study of Parents and Children cohort in and around Bristol, through an in-depth interview between August and November 2001. The results of this study add to the understanding of the underlying behaviour of parents applying pesticide products in the home environment in the UK. Pesticides are readily available, and are normally purchased in do-it-yourself shops and supermarkets and mostly disposed of in domestic waste. Safety was stated by 45% of parents to be the most important factor to consider when buying a pesticide. When buying pesticide products, labels were stated to be the most important source of information about pesticides. However, a third of parents stated they would not follow the product label exactly when using a product, just under half felt labels were both inadequate and hard to understand, and about 10% of parents would not take notice of warnings on the pesticide label. Less than half of parents would use gloves when applying a pesticide, although the use of protective equipment such as gloves during the application of pesticides could greatly reduce the exposure. It is a public health concern that the instructions on the labels of products may not always be understood or followed, and further understanding of user behaviour is needed.

Keywords: Pesticides; Behaviour; Disposal; Interview; Nonoccupational; Parents

1. Introduction

The majority of exposure of the general population to pesticides occurs within the home (Nigg et al., 1990). The home environment is widely considered to be the most commonly pesticide-treated indoor environment, with the main source of pesticides coming directly from the application of products by residents (WHO, 1997) and also from pesticide residues tracked in from the garden.

Nonoccupational pesticides are widely available in the UK, with a large range and high number of products, which are easy to purchase in everyday shops and are applied by amateur users in their homes and gardens. These pesticides include aerosol fly sprays, pest strips, wood preservatives, pesticides to treat problem insects such as cockroaches, rodenticides, and similar products including shampoos to treat head lice and pesticides to treat fleas on pets.

The literature suggests that young children may be a particularly susceptible subgroup of the population to

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any effects resulting from exposure to pesticide products, and importantly that the majority of children's exposure to pesticides occurs within the home environment. A number of epidemiological studies, mostly conducted in the USA, have associated the use of pesticides with a variety of adverse effects in children resulting from chronic exposure, including childhood cancers (Davis et al., 1993; Leiss and Savitz, 1995; Reeves et al., 1981; Gold et al., 1979; Infante et al., 1978; Lowengart et al., 1987; Pogoda and Preston-Martin, 1997).

Pesticides are imperceptible to our senses and any potential harm from exposure is often rare and delayed (Hull, 1999). The creation of risk assessment as a policy tool has been forced in order to attempt to identify, characterise, quantify, and manage the potential risks to human health from pesticides, resulting from their use and exposure (Hull, 1999; Lupton, 1999). The public often does not have a scientific background, and will therefore rely on processes such as intuition in order to assess the extent and likelihood of harm by means of risk perception (Lupton, 1999; Slovic et al., 1997, 1980). The public's risk perception concerning pesticides may affect their use and behaviour while applying the products, both of which have the potential to affect exposure (Grieshop and Stiles, 1989; Neuwirth et al., 2000). The behaviour of an individual when using a pesticide product has the propensity to affect exposure to the pesticide, and it must be better understood for more realistic risk assessments (Baas et al., 2002).

Pesticide products must by UK law have a label, which contains information about the product, hazard information, and instructions for use. Where any products, including pesticides, are authorised in accordance with common principles the provision of enhanced product information such as product labeling assumes consumer understanding and response (Drottz-Sjöberg, 1991). Consumer response may vary according to attitude, experience, and the understanding of the risks involved (Teuber, 1989). Policy must be aware that public perception of a particular risk lead to actions which may have real consequences (Pidgeon, 1998).

The use of protective clothing, gloves, or masks during the application of pesticides can greatly reduce the applicator's pesticide exposure (Teitelbaum, 2002). An observational study in the Netherlands found that 63% of subjects washed their hands after using a biocide spray, and only one individual of 24 wore gloves (Baas et al., 2002). An epidemiological study of cancer in children found that the risk was greater when precautions were not taken, such as ignoring label instructions when using pesticides in the home environment (Pogoda and Preston-Martin, 1997).

A US study has suggested that labels do not impact users' practices, as they are not sufficiently strong in their warnings and recommendations (Grieshop and Stiles, 1989). An observational study in the UK of pesticide labeling showed that little notice was taken of instructions on the labels, and subjects stated that few read the labels except to find out how to use the pesticide, and less would read the safety information (HSL, 1998). Generally the participants found the labels hard to understand, and familiar products were preferred for use and their labels would be less likely to be read, suggesting that their behaviour was based on experience and common sense (HSL, 1998).

The aim of this study was to assess the manner of use of pesticide products and disposal in the home and garden. This will provide important baseline information in UK households, for further national study and studies of pesticide exposure and potential health effects. Currently, there are no comprehensive home and garden pesticide studies in the UK for direct comparison with these results.

2. Materials and methods

As the sampling frame, we used the Avon Longitudinal Study of Parents and Children (ALSPAC). The ALSPAC study has been collecting information on the physical environment on a cohort of about 14,000 children, prenatally to the present day (Golding et al., 2001). To be eligible the expected date of birth had to lie between April 1991 and December 1992 and the mother had to live in the Avon area in and surrounding Bristol (ALSPAC, 2001). Half the population lived in Bristol but the rest were either in suburbs, in rural villages, or in small and large towns.

To recruit parents for the interview, a short screening questionnaire was distributed directly to parents at ALSPAC Focus (examination) Clinics between July and October 2001, which confirmed willingness for further interview of the parents and identified their qualification in the study based on their self-reported pesticide use or nonuse. Eight hundred and thirty-one parents filled out and returned the screening questionnaire, resulting in a high (96%) return rate. Seven hundred and thirteen (86%) parents were willing to be interviewed further at their homes about their pesticide use, and these were stratified into families that self-reported any pesticide "use" or "nonuse." Parents were called at times they had stated as convenient to arrange an interview, and from this 147 were chosen by systematic random sampling for the in-depth interview, within these use or nonuse strata. From the pilot studies, it was suggested that there might be under-reporting of pesticide use due to recall bias, so oversampling (two-thirds of total number of people interviewed) was decided to take place for parents who self-reported no pesticide use in the screening questionnaire. Time and resource constraints limited the number of people that