

PARAQUAT in developing countries

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ABSTRACT

Paraquat, a controversial herbicide, is one of the most used pesticides globally, in most countries without restrictions. It is considered safe by industry and the bulk of regulators worldwide, especially in the context of stewardship programs. However, the few recent studies on exposure assessment and health effects demonstrate that determinants of exposure that were identified thirty years ago still prevail in developing countries. Little is known about systemic absorption of paraquat from occupational exposures. The relations between exposure determinants, levels of external exposure, biomarkers of exposure, and outcomes are far from clear. For example, measured low inhalation levels are inconsistent with frequent episodes of nosebleeds, and it remains uncertain at which inhalation levels nosebleeds occurs and whether these levels may be relevant for systemic uptake. Non-worker populations are also at risk for exposure and health effects, in particular children. High rates of severe acute poisonings, both suicidal and unintentional, have been documented in many countries, also in recent years. There are no strong data that total paraquat poisonings have substantially diminished, and paraquat poisoning clearly remains a severe public health problem in many countries. In addition, topical injuries, including skin problems ranging from mild dermatitis up to severe chemical burns, eye injury, nail damage, and nosebleed, have been observed in proportions as high as 50% of exposed workers in both early and recent surveys. Long-term and delayed health effects may occur, including Parkinson's Disease, lung effects, and skin cancer. Regulatory agencies have not fully recognized either the inherent toxicity of paraquat for human beings or the particular risks derived from exposures in developing countries. Independent risk assessment in the developing country context and application of the precautionary principle are necessary to prevent the occurrence of adverse affects from dangerous pesticides such as paraquat in susceptible third World populations.

CONCLUSIONS AND FINAL REFLECTIONS

- Paraquat is one of the most used pesticides globally and in most countries without restrictions.
- Relatively few exposure and hardly any intervention studies have been performed.
- The understanding of exposure determinants such as climatic circumstances, types of crops, or application methods is limited. It is clear, nonetheless, that paraquat often is applied under hazardous conditions and that in developing countries application techniques have not considerably improved during the last thirty years. Transport systems are still open systems, application equipment easily fails resulting in high exposures
- Possibilities to reduce exposure by wearing protective clothing seem limited. The effectiveness of control measures under tropical conditions remains largely unevaluated.
- Relatively few recent surveys on paraquat poisonings are available. It is uncertain whether this reflects a decline in severe poisoning or partially loss of interest in the problem.
- Suicides increased in Costa Rica in the 1990s compared to the 1980s. Recent reports on suicides come also from other developing countries.
- Despite incompleteness of data and consequent difficulties of interpretation and comparison, paraquat still represents a severe public health problem.
- Occupational and nonoccupational hazards may materialize at any time in a developing country.
- The responsibility for suicidal use of paraquat rests also on the manufacturer. Unrestricted access to a liquid, of which a very small amount may be fatal, makes a suicidal or parasuicidal decision easy.
- Regulatory agencies have not fully recognized either the inherent toxicity of paraquat for human beings or the particular risks derived from exposures in developing countries.
- Independent studies of occupational exposure assessment and health effects are needed.
- The impact of interventions, such as industry stewardship programs, should be properly evaluated.
- If the precautionary principle would be applied in developing countries for the regulation of pesticides, many of the prevailing problems would be prevented.
- The Central American Institute for Studies on Toxic Substances (IRET) will initiate an independent health risk assessment for paraquat in the Central American context.