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Pesticide exposure and genotoxic effects as measured by DNA damage and human monitoring biomarkers

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Abstract

Occupational pesticides exposure rises health concern due to genotoxicity and accumulation of pesticides in human biological matrices. Continuous and sublethal exposure to pesticides had been associated with oxidative stress, mutagenic and cell death. Exposure to pesticides exhibits increased level of DNA damage even if no detectable amounts of pesticides are seen in biological matrices by binding specific areas in the DNA. This interferes normal body systems and mutation in gene encoding specific activities which may lead to a wide range of cancer. Presence of pesticides compounds in human biological matrices had been evident from various studies. However, detection methods are complex and inconsistent, making it difficult to compare and generalize findings. This article provides insight into genotoxic effects, presence of pesticides and their metabolites in human biological matrices and the resultant health effects as measured by DNA damage, acetylcholinesterase (AChE) activity inhibition and other biomarkers of pesticides exposure.

KEYWORDS: Acetylcholinesterase (AChE), occupational exposure, oxidative stress, smallholder farmers