Analysis of Toxic Potential of Organochlorine Pesticides (OCPs) for *CYP1A1*Ile462Val Polymorphism in Agricultural Workers

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ABSTRACT

Introduction: Organochlorine pesticides (OCPs) are widely used in agriculture to protect crops from harmful pests and insects. Aldrin, dieldrin, dichlordiphenyletriehaneDDT and endosulfan are compounds which belong to the group of OCPs.Due to their long-time persistency these compounds cannot degrade easily by biological and environmental mechanisms (Ali et al., 2014). *CYP1A1* is a metabolizing enzyme which plays an important role in metabolism of xenobiotic (Di Nardo et al., 2020). The aim of current study is to analyse the role of *CYP1A1* polymorphism and its association with pesticide exposure.

Objectives:

- Evaluation of toxic ability of OCPs in agricultural workers.
- Analysis of *CYP1A1* polymorphism and its linkage with pesticide exposure.

Methodology: It was a case-control study comprised oftotal n=300 blood samples of pesticide exposed subjects and control. Prior informed consent was taken from each study participant. Genomic DNA was extracted (Chacon-Cortes & Griffiths, 2014). After that, genotyping of targeted *CYP1A1*Ile462Val polymorphismwas performed by Polymerase Chain Reaction (PCR) followed by Restriction Fragment Length polymorphism (RFLP) (Krajinovic et al., 1999). Data was statistically analysed by statistical software SPSS v 20.0.

Result: The allelic distributionshows that A allele was more prevalent in controls (0.76) as compared to exposed subjects (0.64) where G allele was found to be higher in exposed subjects (0.36) as compared to controls (0.24). Therefore, A allele plays a protective role and G allele confers a risk in association with the exposure of pesticides (OR=1.7, $p<0.05$).

Conclusion: The*CYP1A1*Ile462Val polymorphism was found to be significantly associated with pesticide exposure.However further investigation on large scale will be required to validate the findings.

Keywords: Organochlorine pesticides, Persistency, CYP1A1, Polymorphism

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