

Estimation of Level of Pesticide in Recurrent Pregnancy Loss and Its Correlation with Paraoxanase1 Gene in North Indian Population

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Abstract : Objective: The aim of this study is to find the association of PON1 gene polymorphism with pesticides In RPL subjects. Background: Recurrent pregnancy loss (RPL) is defined as three or more sequential abortions before the 20th week of gestation. Pesticides and its derivatives (organochlorine and organophosphate) are proposed to accommodate a ruler chemical for RPL in the sub-humid region of India. The paraoxanase-1 enzyme (PON1) plays an important role in the toxicity of some organophosphate pesticides, with low PON1 activity being associated with higher pesticide sensitivity Methodology: This is a case-control study done in Department of Obstetrics & Gynaecology & Department of Biochemistry, K.G.M.U, Lucknow, India. The subjects were enrolled after fulfilling the inclusion & exclusion criteria. Inclusion criteria: Cases- Subject having two or more spontaneous abortions & Control- Healthy female having one or more alive child was selected. Exclusion criteria: Cases & Control- Subject having the following disease will be excluded from the study Diabetes mellitus, Hypertension, Tuberculosis, Immunocompromised patients, any endocrine disorder and genital, colon or breast cancer any other malignancies. Blood samples were collected in EDTA tubes from cases & healthy control women & genomic DNA was extracted by phenol-chloroform method. The estimation of pesticides residue from blood was done by HPLC. Biochemical estimation was also performed. Genotyping of PON1 gene polymorphism was performed by RFLP. Statistical analysis of the data was performed using the SPSS16.3 software. Results: A sum of total 14 pesticides (12 organochlorine and 2 organophosphate) selected on the basis of their persistent nature and consumption rate. The significant level of pesticide (ppb) estimated by the Mann whiney test and it was found to be significant at higher level of β -HCH (p:0.04), γ -HCH (p:0.001), δ -HCH (p: 0.002), chloropyrifos (p:0.001), pp-DDD (p:0.001) and fenvalrate (p: 0.001) in case group compare to its control. The level of antioxidant enzymes were found to be significantly decreased among the cases. Wild homozygous TT was more frequent and prevalent among control groups. However, heterozygous group (Tt) was more in cases than control groups (CI-0.3-1.3) (p=0.06). Conclusion: Higher levels of pesticides with endocrine disrupting potential in cases indicate the possible role of these compounds as one of the causes of recurrent pregnancy loss. Possibly, increased pesticide level appears to indicate increased levels of oxidative damage that has been associated with the possible cause of Recurrent Miscarriage, it may reflect indirect evidence of toxicity rather than the direct cause. Since both factors are reported to increase risk, individuals with higher levels of these 'Toxic compounds' especially in 'high-risk genotypes' might be more susceptible to recurrent pregnancy loss.

Keywords : paraoxanase, pesticides, PON1, RPL

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