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Increased organochlorine pesticides load in chronic kidney disease patients: Role of glomerular filtration rate and polymorphisms of xenobiotic metabolising enzymes

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Till date there is no clear answer regarding whether high levels of organochlorine pesticides (OCP) found associated with chronic kidney disease (CKD) cause kidney damage or they get accumulated due to falling glomerular function rate (GFR). We have observed that blood OCP levels as analyzed by gas chromatography, show significantly higher levels in CKD patients. Spearman's correlation analysis of OCP levels with eGFR exhibited significant negative correlation for most individual OCPs which persisted even after statistical adjustments for age, sex, BMI, total cholesterol and triglycerides. Another of our studies pointed out association of higher OCP loads in patients with genetic polymorphisms involving CYP1A1. Subjects carrying at least one mutant allele of CYP1A1*2A (TC, CC) and *2C (AG, GG) were found to have a modest rise of odds (1.4-2) of association with CKD. However, genotypic combinations of heterozygous/homozygous mutants were found to be significantly associated with CKD with odds ratios ranging from 1.8-3. Another of our studies, where we also analyzed genetic polymorphisms of GSTM1 and GSTT1, showed similar results. We observed that, presence of GSTM1(-)/GSTT1(-) genotype was associated with 1.8-fold higher odds of association with CKD compared to wild genotypes i.e., GSTM1(+)/GSTT1(+). Logistic regression analysis by taking wild genotypes GSTM1(+)/GSTT1(+) as reference revealed that, in CKD patients several pesticides showed significant association with either null or both null genotypes. The above results suggest that decreasing GFR and genetic polymorphisms involving xenobiotic metabolising genes both play a role in accumulation of OCPs in CKD patients.

Biography

Sudip Kumar Datta has completed his MD in Clinical Biochemistry and currently working as an Assistant Professor in the Department of Laboratory Medicine, AIIMS, India since 2014. He has published more than 10 papers in national and international journals of repute and is also serving as Assistant Editor for the *Journal of Laboratory Physicians*. His area of interest is gene-environment interaction in CKD patients so as to identify potential biomarkers for the disease progression.

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