URINARY N-ACETYL-β-D-GLUCOSAMINIDASE (NAG) AND RETINOL BINDING PROTEIN (RBP) AS PROSPECTIVE DIAGNOSTIC MARKERS FOR FLUORIDE-INDUCED NEPHROTOXICITY IN HUMANS

Javed Ahsan Quadri,[a]Saba Sarwar,[a]M Meraj Alam,[b]Prahalad Singh Bharti,[a]Vikas Sarangal,[a]Arvind Bagga,[c] Roy TS,[a]Das TK[a]
New Delhi and Guwhati, India

SUMMARY: Chronic fluoride toxicity is known to cause dental, skeletal, and non-skeletal fluorosis with the kidneysbeing highly sensitive to fluoride (F) due to their anatomical and functional makeup. The aim of the present study was to investigate if two known urinary markers for renal impairment, when mainly due to tubular injury, N-acetyl-β-D-glucosaminidase (NAG) and retinol binding protein (RBP), could be used as diagnostic markers for F-induced nephrotoxicity in humans. The NAG and RBP levels were evaluated in four different experimental groups: G1 control; G-2 nephrotic syndrome patients with minimal change disease (MCD) with a normal level of F in the body fluids; G-3 nephrotic syndrome patients with a high level of F in the body fluids; and G-4 fluorosis patients. In the G-1 and G-2 groups no significant changes were present in the urinary and serum NAG and RBP levels ($p>0.05$). In the G-3 and G-4 groups a significant increase was present in the urinary NAG and RBP levels ($p<0.05$) while the serum NAG and RBP levels were unchanged ($p>0.05$).The findings reveal that fluoride toxicity caused renal impairment resulting inraised urinary RBP and NAG levels and that these can thus be considered as prospective diagnostic markers for fluoride nephrotoxicity in humans.

Key Words: Diagnostic markers; Fluoride-induced nephrotoxicity; Minimal change disease in kidney (MCD); N-acetyl-β-D-Glucosaminidase (NAG); Retinol binding protein (RBP); Nephrotoxicity; Renal tubular injury.

[a]Department of Anatomy, All India Institute of Medical sciences (AIIMS), Ansari Nagar, New Delhi, India-110029; [b]Department of Surgery, Guwahati Medical College and Hospital (GMCH), Guwahati, Assam; [c]Department of Pediatrics, All India Institute of Medical sciences (AIIMS), Ansari Nagar, New Delhi, India-110029. For correspondence: Professor TK Das, Department of Anatomy, All India Institute of Medical sciences (AIIMS), Ansari Nagar, New Delhi, India-110029, E-mail- drtkdasaiims@gmail.com