OP – 42

Occupational glyphosate exposure and its association with urinary renal injury biomarker (NGAL) among sugarcane farmers in Sri Lanka

Khaja Abdul[1], **Sudheera Jayasinghe[2]**, Saman Chandana[1], Channa Jayasumana[3], Sisira Siribaddana[4], Mangala De Silva[1]

[1]Department of Zoology, University of Ruhuna, Sri Lanka
[2]Department of Pharmacology, University of Ruhuna, Sri Lanka
[3]Department of Pharmacology, Rajarata University, Saliyapura, Sri Lanka
[4]Department of Medicine, Rajarata University, Saliyapura, Sri Lanka

Objectives: Sri Lanka's economy largely depends on agriculture and about 90% farmers use herbicides for crop cultivation. The most commonly used herbicide is glyphosate. However, in 2015, glyphosate import was banned in Sri Lanka due to rise in chronic kidney disease cases in agriculture workers. The purpose of this study was to measure the urinary levels of glyphosate and renal injury biomarker Neutrophil gelatinase-associated lipocalin (NGAL) in sugarcane farmers from Uva Province.

Methods: A cross sectional study was conducted recruiting exposed farmers (study group) from Rahathangama (N=69) and Warunagama (N=66). Non exposed farmers (control group) were recruited from Matara (N=75). Urine samples were analyzed for glyphosate and NGAL using ELISA. Statistical analysis performed using IBM statistics (v23), $P < 0.05$ was considered as significant.

Results: Mean (SEM) of creatinine adjusted urinary glyphosate (µg/g Cr) levels in Rahathangama, Warunagama and Matara participants were 250.4 (18.8), 271.3 (23.7) and 186.2 (6.5) respectively. Mean (SEM) of creatinine adjusted urinary NGAL (ng/mg Cr) levels in Rahathangama, Warunagama and Matara participants were 12.0 (2.8), 12.4 (4.7) and 2.1 (0.3) respectively. Urinary glyphosate and NGAL levels were significantly high in exposed farmers compared to control group ($P < 0.05$). Creatinine adjusted urinary glyphosate was significantly correlated with creatinine adjusted urinary NGAL ($r^2 = 0.49$; $P < 0.0001$).

Conclusion: In this study, we reported significantly high urinary glyphosate and NGAL levels in study group compared to control group. Further, creatinine adjusted urinary glyphosate and NGAL were correlated. We conclude that, occupational exposure to glyphosate may have triggered renal injury as observed through elevated levels of urinary NGAL.