EVALUATION OF BIOCHEMICAL MARKERS OF RENAL FUNCTION IN SUGARCANE WORKERS EXPOSED TO SUGARCANE BURNING

Cinthia Martins Menino Diniz; José Rafael Soares da Silva; João Pedro Alves Gomes; André Luiz Lima Silveira; Thacianna Barreto da Costa; Maira Galdino da Rocha Pitta; Moacyr Jesus Barreto de Melo Rego; Michelle Melgarejo da Rosa; Michelly Cristiny Pereira;

Federal University of Pernambuco (UFPE). Graduate Program in Therapeutic Innovations (PPGIT). Suely Galdino Therapeutic Innovations Research Center (NUPIT-SG). Recife-PE.

ABSTRACT

INTRODUCTION: Manual harvesting of burned sugarcane exposes workers to continuous inhalation of pollutants derived from soot. Such exposure is associated with systemic inflammation and increased risk of renal injury induced by environmental toxins. OBJECTIVE: To evaluate biochemical markers of renal function in sugarcane workers exposed to the conditions of harvesting burned sugarcane. **MATERIALS AND METHODS:** Cross-sectional study, part of an ongoing doctoral thesis, included 25 workers exclusively involved in manual sugarcane cutting. Individuals with preexisting inflammatory conditions and confounding factors, such as passive or active smoking, use of wood stoves, pesticides, or occupational risk activities, were not taken into consideration. Data collection took place during the harvest season (October 2023 and November 2024) in a municipality in Pernambuco, Brazil, where sugarcane cultivation is the main economic activity. Blood serum samples were analyzed for urea, creatinine, uric acid, albumin, and total protein using the A25 Biochemical Analyzer (Biosystem), considering the reference values of the Brazilian Society of Nephrology. Statistical analysis was performed using IBM® SPSS® Statistics 20.0, applying descriptive statistics, simple and multiple linear regression, and relative risk (RR) estimation for acute kidney injury. **RESULTS AND CONCLUSION:** All workers had high levels of albumin and total protein, 28% had increased urea and uric acid, 8% had low and 8% high creatinine levels. Correlation analysis revealed no statistically significant associations between years of occupational exposure and renal markers, except for uric acid, which showed a downward trend with longer time in the field ($p \approx 0.051$), which may be related to physiological adaptation over time. Multivariate analysis confirmed a significant negative association with years of work ($p = 0.003$) and a positive association with age ($p = 0.0189$). The estimated RR for AKI was 1.18 ($p = 0.82$; 95% CI: 0.29–4.81). Although this is a pilot study with a small sample, the results suggest early renal changes possibly related to exposure to nephrotoxic agents present in sugarcane soot, highlighting the importance of occupational clinical monitoring.

KEYWORDS: Sugarcane burning; Occupational health; Renal markers.