

ABSTRACT

Background: Petrol (gasoline) station workers are chronically exposed to volatile petroleum constituents (BTEX) that may harm multiple organs, including the kidneys. Local evidence from Yemen—particularly coastal Hodeidah City—is scarce despite long working hours and limited occupational safeguards.

Objective: To evaluate selected markers of renal function among petrol station workers in Hodeidah and compare them with a matched, non-exposed control group, and to explore relationships between exposure characteristics and kidney markers.

Methods: A comparative cross-sectional study of 200 male participants (100 petrol station workers, 100 non-exposed controls) was conducted. Data on occupational history, hydration, smoking and medical history were collected by questionnaire. Venous blood was analyzed for serum urea and creatinine using an automated chemistry analyzer. Group differences were tested with t-tests and correlations and multivariable analyses assessed exposure–response relationships.

Results: Mean serum urea and creatinine were significantly higher in exposed workers (urea: 20.63 ± 5.67 mg/dL vs 18.61 ± 5.61 mg/dL, $p = 0.012$; creatinine: 1.07 ± 0.23 mg/dL vs 0.95 ± 0.17 mg/dL, $p < 0.001$).

Elevated creatinine was more prevalent among workers (7% vs 1%). Serum creatinine correlated positively with daily hours of work ($r = 0.229$, $p = 0.022$); workers exceeding 10 hours/day had the highest mean creatinine. Reported findings remained significant after adjustment for age, smoking and medical history.

Conclusion: Occupational exposure to petrol vapors in Hodeidah is associated with modest but statistically significant alterations in renal biomarkers, with longer daily working hours linked to greater effect. Routine medical screening, exposure reduction, hydration promotion and improved occupational protections are recommended for this workforce.

Keywords: petrol station workers; renal function; creatinine; urea; occupational exposure; Hodeidah, Yemen.