ACUTE KIDNEY INJURY

Acute kidney injury associated with burnt sugarcane harvesting

An endemic of chronic kidney disease—termed ‘Mesoamerican nephropathy’—has been identified among young and previously healthy plantation workers in Central America. The aetiology of Mesoamerican nephropathy is unknown, but is thought to involve repeated episodes of daily dehydration and hypovolaemia associated with rhabdomyolysis. A new study of renal function among harvesters of burnt sugarcane in Brazil shows that acute changes in markers of

kidney function occur over the course of a harvesting day. “Our findings support the hypothesis that repeated episodes of dehydration is a possible causative factor in Mesoamerican nephropathy,” says lead author Ubiratan Paula Santos.

To evaluate the acute effects of a typical harvesting day, Paula Santos and colleagues from the University of São Paulo Medical School, Brazil, collected blood and urine samples before and after a daily work shift in the last month of the harvesting season. “The typical harvesting day is carried out under insalubrious conditions, with extremely physical work, high temperatures and exposure to pollutants,” explains Paula Santos.

At the beginning of the harvesting season, all 28 participants were considered to be healthy, with no sign of systemic or renal disease. In the last month of the harvesting season, however, all participants experienced an increase in serum creatinine level and a decrease in estimated glomerular filtration rate (eGFR) over the course of the working

day (pre-shift versus post-shift values: $70.7 \pm 8.8 \mu\text{mol/l}$ versus $93.70 \pm 1.68 \mu\text{mol/l}$ [$P < 0.001$] for serum creatinine and $120 \pm 9.0 \text{ ml/min/1.73 m}^2$ versus $100 \pm 15.0 \text{ ml/min/1.73 m}^2$ [$P < 0.001$] for eGFR as measured by CKD–EPI). “In 19% of workers, the increase in serum creatinine level was consistent with a diagnosis of acute kidney injury,” notes Paula Santos. The researchers also recorded evidence of muscle injury and bursts of systemic inflammation.

Paula Santos and colleagues have already started a new project, with a greater number of participants, to assess urinary biomarkers for kidney injury. “Future results may help us understand the mechanisms of this type of kidney injury and help to establish preventative interventions,” he concludes.

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