

Kidney disease in plantation workers

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Poor working conditions in a hot climate with regular dehydration and mineral deficiency is probably what causes the chronic kidney disease Mesoamerican nephropathy in Central American and Mexican agricultural workers, researchers at Karolinska Institutet and their colleagues in Nicaragua and El Salvador conclude. For their study, which is published in the scientific periodical the *American Journal of Kidney Diseases*, the researchers examined kidney tissue in people with this disease.

Mesoamerican nephropathy (MeN) is a chronic [kidney disease](#) that affects many men in rural Central America engaged in physical labour in a hot climate. Over the past 20 years, several regions in Central America have seen a dramatic increase in chronic kidney disease that is unrelated to diabetes or high blood pressure. In some villages in El Salvador, up to 18 per cent of the working male population are affected. Chronic kidney disease was also the second most common cause of death amongst male nationals in 2009, most of whom were young plantation (mainly sugar) workers.

"This is a serious health problem that deserves attention, research and preventative measures," says principal investigator Julia Wijkström, doctoral student at the Department of Clinical Science, Intervention and Technology.

Ms Wijkström and her colleagues from Karolinska Institutet, Nicaragua and El Salvador have studied [kidney biopsies](#) and blood and urine samples from 19 sugar cane workers with MeN in Nicaragua. She also

looked at the long-term impact of the disease on kidney function in MeN patients in Nicaragua and El Salvador. Her results show that people with MeN have unique tissue morphology in kidney biopsies with indications of anoxia in the glomeruli and chronic damage to the renal tissue but normal vessel structures. The patients often display a salt imbalance with low levels of sodium, potassium and magnesium. The findings corroborate earlier work by the group on a smaller group of plantation workers in El Salvador with kidney disease.

Deterioration continues

The study also shows that [kidney function](#) in the affected people generally continues to deteriorate even when they stop becoming dehydrated in this working environment. Measures of prevention and early detection are therefore important.

"Scientists are gradually becoming aware of the disease, as are the local health authorities," says Ms Wijkström. "Hard physical labour in a hot climate has been identified as a strong risk factor in this disease, which is probably exacerbated by repeated dehydration and mineral deficiency. There are reports from other hot regions of the world of rising incidences of [chronic kidney disease](#), and it's not unlikely that we're seeing a global epidemic propelled by global warming."

More information: Julia Wijkström et al. Renal Morphology, Clinical Findings, and Progression Rate in Mesoamerican Nephropathy, *American Journal of Kidney Diseases* (2017). [DOI: 10.1053/j.ajkd.2016.10.036](#)

Provided by Karolinska Institutet

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