ASSESSMENT OF DEHYDRATION AND ITS EFFECT ON THE RENAL FUNCTIONS OF THE FARMERS OF DRY ZONE OF SRI LANKA

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Chronic kidney disease of unknown etiology is a major health care problem in North Central Province of Sri Lanka. The most affected category is the male farmers in the age group 35-60 years. They are engaged in paddy and chena cultivation. During land preparation period in late October, the farmers are engaged in outdoor heavy manual work over 10-13 hours per day in dry, warm weather. This study was undertaken to assess the dehydration and its effect on renal functions of the farmers with a matched control group of the dry zone of Sri Lanka and the influence of using spring water for drinking and/or cooking on renal functions.

Urine electrolytes and osmolality were determined in cases and controls before and after routine work and water intake and urine output was measured for the same period. Serum creatinine and electrolytes were determined from blood samples collected after routine work. The same tests were repeated to the test group after using natural spring water for two weeks.

Anthropometric data showed that the case group had significantly lower height, weight and BMI than the control group ($p<0.05$). Case group consumed more water than the control group ($p=0.001$). The urine output of the case group was significantly lower than the control group. Farmers have significantly low urine Na^+, Cl^-, K^+ and osmolality than controls before ($p<0.05$) and after ($p<0.05$) work. However the urine creatinine concentration did not show a significant difference between the two groups before ($p=0.195$) and after ($p=0.287$) work.

The analysis of serum samples collected after routine work showed that the serum osmolality, serum concentrations of K^+ and creatinine in farmers were significantly higher ($p<0.05$) than the controls and GFR significantly lower than the controls ($p=0.011$). The analysis of urine samples collected before and after work from farmers did not show a significant difference in specific gravity ($p=0.964$), urine osmolality ($p=0.279$), urine Na^+($p=0.848$), urine K^+ ($p=0.708$) urine Cl^- ($p=0.348$), urine creatinine ($p=0.685$). Similarly no significant differences in specific gravity ($p=0.211$), osmolality ($p=0.409$), Na^+ ($p=0.341$), K^+ ($p=0.657$), Cl^- ($p=0.414$), creatinine ($p=0.533$) in urine samples collected in the morning and afternoon from the controls were observed. After changing the water source to spring water for 14 days urine specific gravity ($p=0.156$), urine osmolality ($p=0.772$), urine Na^+ ($p=0.086$), urine K^+ ($p=0.445$), urine Cl^- ($p=0.425$) did not show significant differences than before. However, the urine creatinine was significantly low after consuming spring water than before ($p=0.043$).

Serum osmolality ($p=0.596$), serum Na^+ ($p=0.84$), serum K^+ ($p=0.166$), serum Cl^- ($p=0.311$) serum creatinine ($p=0.946$) and GFR ($p=0.813$) before and after changing the water source were also not significantly different.