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IDENTIFYING THE BEST CUT-OFF VALUES FOR RENAL BIOMARKERS TO DIFFERENTIATE CKDu PATIENTS AND ENDEMIC CONTROLS

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Chronic Kidney Disease of uncertain aetiology (CKDu) is a major health issue that mainly affects agricultural communities in the North Central Province of Sri Lanka. The disease was first identified in the North Central Province in the mid-1990s, and by now, many people across the country have been infected with the disease. The most common CKDu victims are adult male farmers in rural areas. CKDu does not show any early symptoms, and the patients will be in the end-stage when they are referred for treatments. The aim of this study is to identify the best cut-off values for significant renal biomarkers to differentiate the CKDu patients from the endemic control (EC) group. A cross-sectional study was conducted on the above-mentioned two groups where the patient group included 75 cases of definite CKDu while the control group was 79 dipstick-negative individuals from the endemic area. Eight biomarkers (measurement unit – ng/g-Cr) were considered along with other clinical factors to identify the significant biomarkers that differentiate CKDu from EC. According to mean comparison tests, there were significant differences in mean biomarker levels between the two groups ($p < 0.001$). Cystatin C (CTS3), Osteopontin (OPN), and Retinol Binding Protein 4 (RBP4) were identified as significant biomarkers from the binary logistic model (Accuracy = 95.8%). Receiver Operator Characteristic curves were fitted for the identified biomarkers, and candidate cut-off values were derived based on Specificity, Sensitivity, Youden's Index and Closest Top left criteria. The best cut-off values were 236.499, 2.107, and 85.53 for RBP4, CTS3, and OPN, respectively. These cut-off values can be used to identify the possible patients at risk of CKDu at early stages where conventional biomarkers and symptoms are not yet visible. Early detection of the disease will help to manage treatments and hence better intervention of CKDu in endemic areas.

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Keywords: Best cut-off value, Chronic Kidney Disease, Renal biomarkers, ROC curve