Agricultural Risk Index for Chronic Kidney Disease of Unknown Origin

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Chronic Kidney Disease due to unknown aetiology (CKD-U) is one of the growing health problems in Sri Lanka. About eight thousand diagnosed CKD-U patients are enduring treatment, largely in the North Central Region (NCR) 90% of the patients are farmers. The study is designed to estimate an agricultural risk index for an individual who lives in high risk areas of the country. The study is a case control study and 315 CKD-U patients and 321 normal healthy individuals were randomly selected from NCR. The age, sex and agriculture related risk factors were collected from both patients and controls. Multiple linear logistic models were used to calculate the risk index.

The gender of the individual (male, female), age category (<45, 45-60, 60>years), extent of land cultivated (>1, <1hectares), exchange of labour (hiring labour, high or low), usage of agrochemicals (yes or no) protective measures against agrochemicals (low or high) were considered for the calculation of the index using the following formula:

$$\ln(\pi/1-\pi) = \beta_0 + \beta_1 x \text{ age} + \beta_2 x \text{ gender} + \beta_2 x \text{ (cultivated area x exchange of labour)} + \beta_4 x \text{ (usage of agrochemicals x protective measures against agrochemicals)}$$

(π = probability of the disease occurrence, β_0=regression constant, β_i = Regression coefficient of the i^{th} variable).

According to the multiple linear regression logistic models, the maximum and minimum risks were calculated as 1.0 and 0.0 respectively. The male individual > 60 years of age, low exchange of labour and poor protective measures against agrochemicals had the highest risk of getting CKD-U irrespective of the cultivated land extent (p =0.87). Females < 45 years of age with high labour exchange and using good protective measures had the lowest risk (p= 0.14) irrespective of the cultivated land area. The calculated risk index will be useful to identify individuals at risk of developing CKD-U and to implement preventive strategies for the disease in the high-prevalence area. The individuals > 60 years of age with poor agricultural practices had the maximum possibility of getting CKD-U probably due to long term exposure to the aetiological agents and risk factors in this area.

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