

Prevalence of Low Glomerular Filtration Rate (Low eGFR), Proteinuria and Associated Risk Factors in a Rural Area of Bangladesh using Cockcroft-Gault and Modification of Diet in Renal Disease Equation: An Observational, Cross-sectional Study

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Background & objectives

Chronic kidney disease (CKD) has become a global public health concern. The adverse outcomes of CKD are enormous in developing countries due to paucity of facilities for renal replacement therapy and high cost of services for management of ESRD. Chronic kidney disease and its risk factors are common in Bangladesh, however community-based data on the subject is lacking. The purpose of this study to estimate and compare the prevalence of low GFR, proteinuria and associated risk factors using Cockcroft-Gault (CG) and Modification of Diet In Renal Disease (MDRD) equation based on serum creatinine (SCr) in a rural area of Bangladesh.

Methods

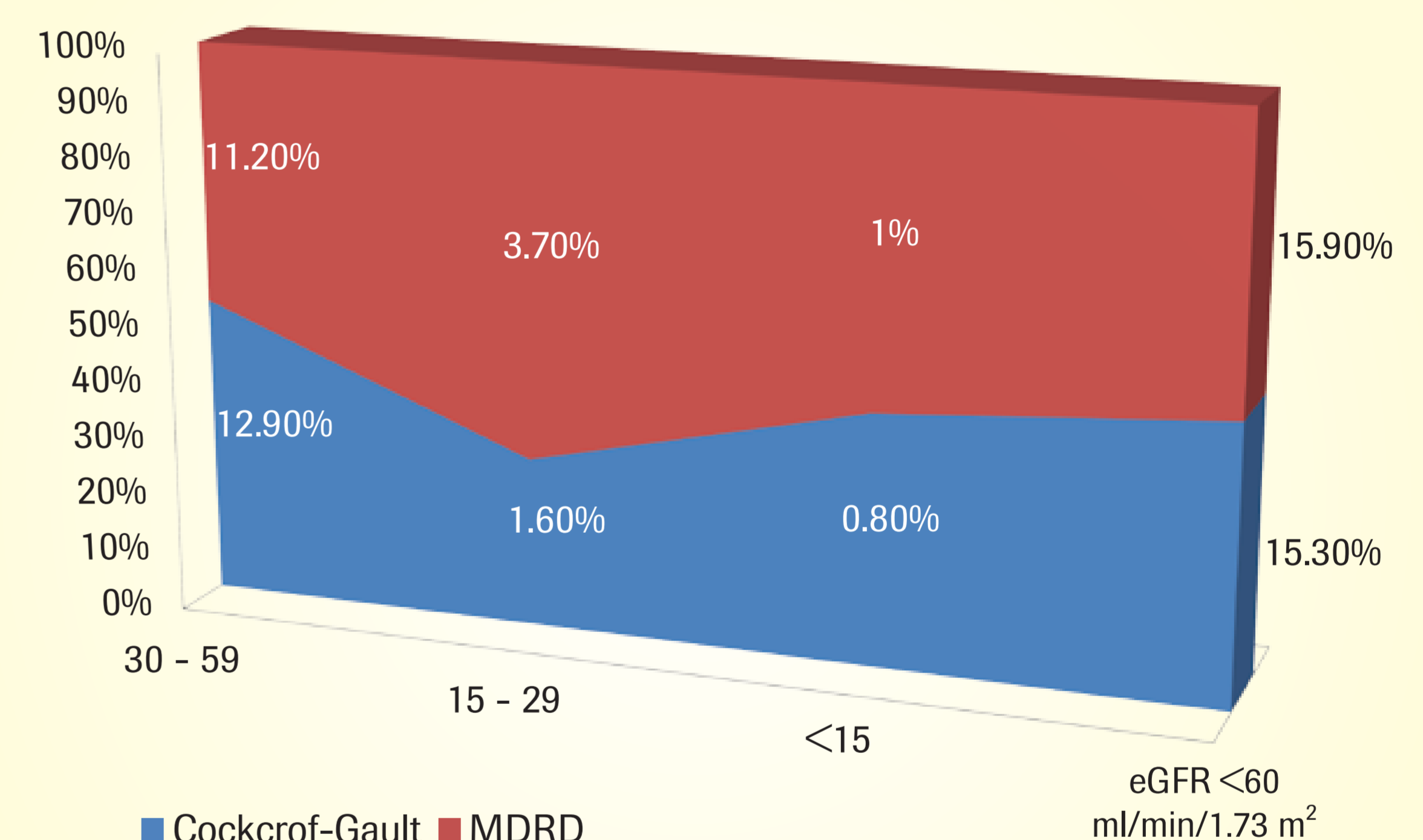
An observational cross-sectional study performed on patients aged 18 years or older living in the rural area of Mymensingh were randomly selected from the database of the health care system and who gave informed consent to participate in the study. Subjects with nonresidents, pregnant, cognitive dysfunction that interfered with understanding and answering the study questionnaire were excluded from the study. The sample size was calculated with a formula for cross – sectional study and to meet the following criteria: a confidence level of 95%, acceptable error 15% and expected prevalence of CKD 15.7%. Therefore a sample size of 920 was considered appropriate for the study. The study was carried out for a period of 16 months between March 2014 and June 2015. Renal impairment was defined as eGFR less than 60 ml/min/1.73 m². Thus stage 3, 4 and 5 of KDOQI were grouped as renal impairment. Renal function was estimated from serum creatinine using Cockcroft-Gault and MDRD (modification of diet in renal disease) equations. Data are presented as frequencies, percentages or mean ± standard deviation as appropriate. The Chi-square test was used for categorical variables and multivariate analyses was performed by binary logistic regression to identify the risk factors of CKD. All statistical tests were 2-sided. A p value lower than 0.05 was considered to be significant. All statistical analysis were done with SPSS Version 11.5 for Windows.

Results

Over half, 51.7% of the patients were male and rest 48.3% female with mean age 42.3 ± 13.2 years. Most (67.3%) of the patients were illiterate and only 22.8% engaged in salaried job. Over two-third (67.4%) of the patients were over weight and obese, 31.2% normal and very few (1.4%) under weight. The prevalence of low eGFR was 15.3% by Cockcroft-Gault and 15.9% by MDRD equation. The survey population had a 17% prevalence of proteinuria. Sex, illiterate, over weight & obese, obese by WC, hypertension, proteinuria, raised serum creatinine, diabetes mellitus, anaemia, family H/O CKD, low HDL cholesterol and raised total cholesterol were found to be the independent predictors of CKD.

Characteristics	Frequency	Percentage
Age (years)		
<30	198	21.5
30 – 50	431	46.8
50 – 70	273	29.7
≥70	18	2.0
Sex		
Male	476	51.7
Female	444	48.3
Educational status		
Illiterate	619	67.3
Literate	301	32.7
Salaried job	210	22.8

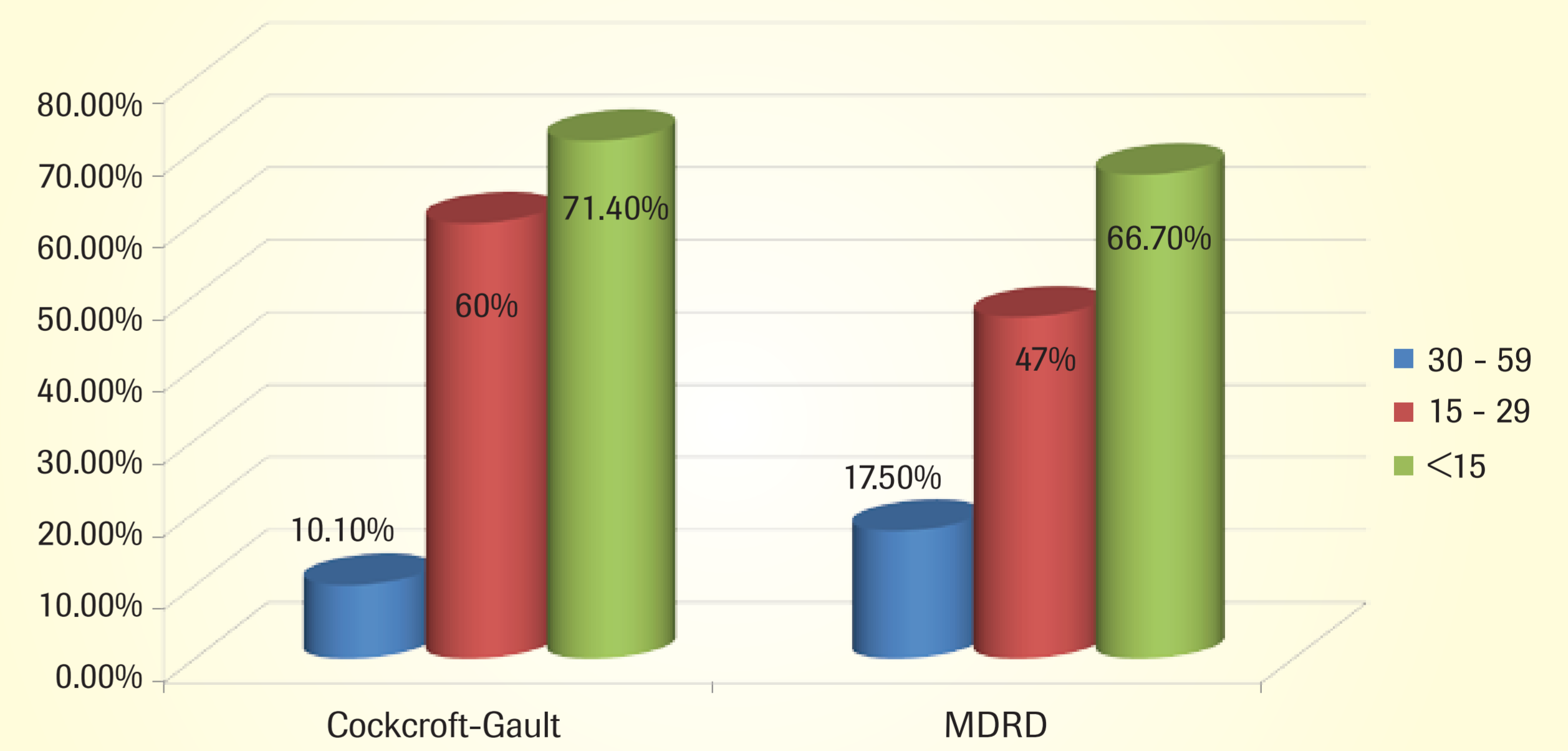
Demographic variables of the patients (n = 920)



eGFR (ml/min/1.73 m²) Cockcroft-Gault Vs MDRD

Body Mass Index (Kg/m ²)	Frequency	Percentage
Under weight	13	1.4
Normal	287	31.2
Over weight & obese	620	67.4

Distribution of patients according to Body Mass Index (n = 920)



Proteinuria (≥ 1+): prevalence in total population

Conclusion

The prevalence of low eGFR in this rural population is common and an increase prevalence of proteinuria. The association between CKD and risk factors was also highly significant. There is an urgent need for more detailed measurement for these risk factors through a comprehensive survey to evaluate individuals with risk factors, to enable earlier detection and risk factor reduction through rising of awareness.

Size : 90 cm x 130 cm