

Microalbuminuria in Patients with Hypertension Visiting Tertiary Care Centre, Western Nepal

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Abstract : Background and Objective: Microalbuminuria is often regarded as a sign of end-organ damage due to hypertension, with an increased risk for renal diseases. The present study was designed to find the prevalence of microalbuminuria in hypertensive patients by determining albumin creatinine ratio (ACR) and the association of ACR and microalbuminuria status with different stages and duration of hypertension (HTN). Also, to establish the correlation of systolic and diastolic blood pressure (SBP and DBP) with various parameters viz; ACR, urinary microalbumin (UMA), estimated glomerular filtration rate (eGFR), urinary creatinine (Ucreat), serum creatinine (Screat), and find out their significance among HTN and ACR status. Materials and Methods: A hospital-based cross-sectional study was conducted in the Department of Biochemistry in collaboration with the Department of Internal Medicine, UCMS, Bhairahawa, Nepal from April 2019 to September 2019 after obtaining ethical approval from institutional review committee (IRC), UCMS. A total of 120 hypertensive patients were enrolled whose blood, and spot urine samples were taken. eGFR was calculated by using Cockcroft-Gault formula after determining Screat while ACR was calculated after measuring Ucreat and UMA from the spot urine sample. Creatinine was estimated from modified jaffes' reaction, whereas urinary micro albumin was done by Mispa i3 analyzer. Data were analyzed by using SPSS. 20 using p-value ≤ 0.05 as statistically significant. Results: In our study, the highest enrolled were grade II HTN (36.7%) followed by normal (33.3%), grade I (20.8%) and grade III (9.2%). Evaluating the ACR status, 19.2% were microalbuminuria, and the rest were normal. Though the ACR status (normal and microalbuminuria) was not statistically significant with HTN status ($P=0.860$) and the duration of HTN status ($P=0.165$), 5 (45.5%) out of 11 grade III HTN were microalbuminuria and the prevalence was also higher for longer duration i.e., more than 10 years. In microalbuminuria, both the SBP ($p=0.023$, $r=0.471$) and DBP ($P=0.034$, $r= 0.444$) were strongly and positively correlated with Screat, in contrast to eGFR, which was negatively but weakly correlated. With the significant difference between the HTN group, the mean ACR ($P=0.047$) and UMA ($P=0.02$) were found to be highest among grade III patients, i.e., 84.3 ± 113.3 mg/gm. and 88.4 ± 83.9 mg/l respectively. The mean eGFR (64.2 ± 24.8 vs 77.2 ± 18.1 ml/min) was considerably lower in microalbuminuria ($p=0.026$) than the normal in contrast to the SBP (160 ± 33.7 vs. 146.6 ± 19.5 mm of Hg) which was significantly higher ($P=0.008$). Among the different BMI category, the mean ACR was found to be significantly different ($P= 0.01$) with the highest value in underweight (115.2 ± 51.5 mg/gm.) and lowest in overweight (31.8 ± 4.3 mg/gm.). Conclusion: The study recommends that the microalbuminuria can be a very useful and imperative predictor of deranged kidney functions in hypertensive patients. The high value of ACR and UMA in hypertensive patients along with significant increased Screat, SBP whereas decreased eGFR in microalbuminuria patients explicitly supports the above statement.

Keywords : albumin creatinine ratio, hypertension, microalbuminuria, renal disease

Conference Title : ICLMBS 2020 : International Conference on Laboratory Medicine and Biomedical Science

Conference Location : Sydney, Australia

Conference Dates : March 26-27, 2020