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Utility of albumin creatinine ratio (ACR) in monitoring diabetic retinopathy and nephropathy

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Statement of the Problem: Diabetic retinopathy and nephropathy are classified as microvascular complications of diabetes. Diabetic nephropathy (or diabetic kidney disease) is a progressive kidney disease caused by damage to the capillaries in the kidneys' glomeruli. It is characterized by nephrotic syndrome and diffuse scarring of the glomeruli. It is due to longstanding diabetes mellitus, and is a prime reason for dialysis in many developed countries. Diabetic retinopathy (DR) is a common vascular complication of diabetes, and a leading cause of sudden loss of vision. DR progresses from mild non-proliferative abnormalities to moderate and severe non-proliferative DR (NPDR), and to proliferative DR (PDR), which is characterized by gradual alterations in the retinal microvasculature leading to increased vascular permeability, retinal non perfusion, and pathological intraocular proliferation of retinal vessels. These complications are highly prevalent and place a significant burden on society if left untreated; therefore, early detection of DR and diabetic kidney disease (DKD) is important.

Objective: To evaluate albumin creatinine ratio (ACR) as a screening marker for detection of early diabetic retinopathy and nephropathy.

Methodology & Theoretical Orientation: This cross-sectional study was conducted in Combined Military Hospital, Multan from 15th January to 20th July 2017. A total of 386 patients were included in the study. They were known diabetics on treatment who reported for monitoring of diabetes and their urine protein was negative on dip strip. Informed consent was obtained from the patients and study was approved by the ethical review committee of the institution. 10 ml of random urine sample was collected in a clean container. Urinary albumin and creatinine were estimated by turbidimetric inhibition immunoassay and Jaffe kinetic reaction respectively, ACR was calculated as mg/mmol of creatinine. The statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) software, version 23.

Findings: Total 386 diabetic patients were included in the study. Females were 38% while males were 62%. Minimum age was 34 years and maximum was 72 years with a mean age of 47±2.4 yrs. 6% patients were under the age of 40 years, 20% were between 40 to 50 years of age while 74% were more than 50 years of age. ACR levels were significantly different among the DR stages. ACR was <3mg/mmol in 74% patients indicating normal renal status and having no to mild-ok moderate NPDR, between 3-30 mg/mmol in 26% patients indicating micro albumin urea i.e. early diabetic nephropathy and having severe NPDR and PDR.

Conclusion & Significance: In conclusion, the results of this study show that ACR level is associated with severity of DR and DKD. Therefore, normal-to-mildly increased albuminuria in diabetic patients should not be overlooked and requires close monitoring for early detection of complications.

Biography

Muhammad Aneeq Haroon is a final year MBBS student at Foundation University Medical College, Islamabad. His main interest is specializing in Ophthalmology, Neurology and Pathology. His present research paper is on the topic of 'Prevalence of migraine and tension type headache in medical students' at 9th ANRD – Annual Neurology.

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