IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

EFFECT OF GLYCATED HAEMOGLOBIN AND PROTEINURUIA IN METABOLIC SYNDROME PATIENTS OF DIABETIC NEPHROPATHY

Gulab Kanwar[1], Shipra Jain[1], Shiv Rathore[1]

[1]Professor and Head of Department, [2]PhD scholar, [3] Associate Professor

[1]Department of Biochemistry, Government Medical College, Kota, Rajasthan, India.

Abstract:

Background: Diabetic nephropathy is characterised as either elevated urine albumin excretion or reduced glomerular filtration rate or both.

Aim: The objective of this study is effect of HbA1C and proteinuria in metabolic syndrome of Diabetic nephropathy patients. This approach is used to take precautions to treat metabolic risk factors associated with renal disease.

Result: This study was conducted on 293 subjects of metabolic syndrome of Diabetic nephropathy at Government Medical College and associated groups of hospitals Kota, Rajasthan from September 2019 to August 2021. 293 cases of metabolic syndrome.

Conclusion: Urine dipstick test were found to be positive in 82.6% of metabolic syndrome patients. In our study it has been shown that poor glycaemic control and urine protein dipstick test has an association with metabolic syndrome of diabetic nephropathy.

Keyword: HbA1C- glycated haemoglobin, AC- abdominal circumference, HDLc-high density lipoprotein-cholesterol, BP- Blood pressure.

Introduction: Metabolic syndrome must have three or more parameters in combination via AC {>102cm for men and > 88cm for women}, HDL{<40 mg/dl for men and < 50 mg/dl for women},individual with antilipemic medicines, TG[>=150mg/dl or patients on dyslipidemic medicines], BP[>=130/85mmHg or individuals on antihypertensive medicines] , an fasting blood sugar[>100mg/dl or individuals on hypoglycemic drugs](1).

Diabetic Kidney Disease also stated as diabetic nephropathy. It is identified as either elevated urine albumin excretion or reduced glomerular filtration rate or both.

Method:

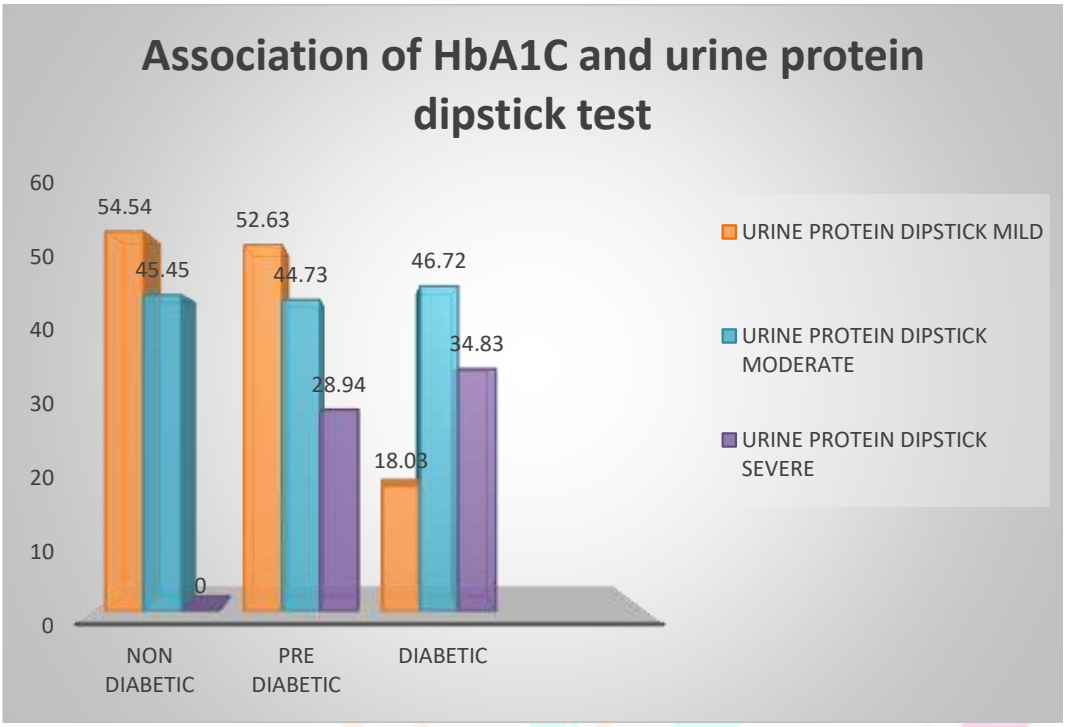
Inclusion criteria: Patients diagnosed with both DM-2 and CKD, as per the criteria were included in our study, in which eGFR ≤60mg/ml/1. This study was conducted on 293 subjects of diabetic nephropathy at Government Medical College and associated groups of hospitals, kota , rajasthan. The patients and study design approval was taken by the institutional ethical committee .

This study group has confirmed cases of type 2 diabetes mellitus contains 293 cases of metabolic syndrome as confirmed by using NCEP ATP III criteria of metabolic syndrome.

Exclusion criteria: Subjects with type I diabetes mellitus, acute kidney injury, known renal transplant, history of hematuria, symptomatic urinary tract infection, pregnant women, Undergoing treatment with oral antidiabetic drug and antihypertensive drugs.

Venous blood was drawn under aseptic condition from clinically diagnosed cases of diabetic nephropathy and collected in a plain vial. 3 ml blood was discharged into EDTA vacutainer and analysed for HbA1C. And 10ml urine sample was collected in sterile container for urine protein dipstick test. HbA1C was calculated by boronate affinity method.

Result:



Graph1: Association of glycated haemoglobin and urin protein dipstick test in metabolic syndrome patients of diabetic nephropathy

table1: no. of patients in percentage to be found in according to glycated haemoglobin level in metabolic syndrome patients of diabetic nephropathy.

urine protein dipstick test			
	mild	moderate	severe
non diabetic	54.54	45.45	0
pre diabetic	52.63	44.73	28.94
diabetic	18.03	46.72	34.83

table2: association of hba1c with metabolic syndrome cases in diabetic nephropathy

association hba1c with metabolic syndrome patients of diabetic nephropathy	
HbA1C	**metabolic syndrome**
less than 6.5%	17.4%
more than 6.5%	82.6%

Discussion: To investigate the relationship between HbA1C and metabolic syndrome and the urine protein dipstick test, we discovered that

• In cases of metabolic syndrome in Diabetic nephropathy patients, there were non diabetic patients (n=11), pre diabetic patients (n=38), and diabetic patients (n=244) in terms of HbA1C.

• In which non-diabetic patients (n=11) had 54.54% mild cases of urine protein dipstick test, 45.45% moderate cases of urine protein dipstick test, and no severe cases of urine protein dipstick test.

- In pre diabetic patients (n=38), shows 52.63% of mild cases of urine protein dipstick test. 44.73% of moderate cases of urine protein dipstick test and 28.94% of severe cases of urine protein dipstick test.
- In diabetic patients (n=244) shows 18.03% of mild cases, 46.72% of moderate and 34.83% of severe cases of urine protein dipstick test.

Therefore, we draw the conclusion that the association of HbA1C ≥6.5% shows the highest number of moderate cases of urine protein dipstick test as compared to mild and severe cases.

Urine protein dipstick test prevalence is 17.40% in HbA1C ≤6.5% and 82.60% in HbA1C ≥6.5%. It demonstrates an association between poor glycemic management and a higher prevalence of urine protein dipstick test in diabetic nephropathy patients..

An analysis of 907 individuals of median age 58 years (interquartile range, IQR 49 to 66), and 62.8% were males, according to Lucero Del Carmen Collazos-HuamánI, et al in 2022. Poor glycemic control was found in 39.8% of people, while albuminuria was seen in 22.7%.

Albuminuria was found in 32.7% of those with poor glycemic control and 16.1% of people with excellent glycemic control. We discovered a statistically significant association between poor glycemic control and albuminuria in the adjusted regression analysis (annual percentage rate, aPR = 1.70; 95% CI: 1.28-2.27).

Our findings on the association between poor glycemic control and albuminuria were consistent with those published in previous studies in India,2,3 Iran,4Nigeria5, and Pakistan.6

In a cross-sectional research conducted in Nepal in 2015 found an association between albuminuria and HbA1c, the difference in results was likely caused by the small sample size, as the authors of that study noted.7

Conclusion: Urine dipstick test were found to be positive in 82.6% of metabolic syndrome in diabetic nephropathy patients. In our study it has been shown that poor glycemic control and urine protein dipstick test has an association with metabolic syndrome .

References:

1.Lee CC, Sun CY, Wu IW, Wang SY, Wu MS. Metabolic syndrome loses its predictive power in latestage chronic kidney disease progressionÐa paradoxical phenomenon. Clin Nephrol. 2011; 75: 141± 149. PMID: 21255544

2. Park YW, Zhu S, Palaniappan L, Heshka S, Carnethon MR, Heymsfield SB. The metabolic syndrome: Prevalence and associated risk factor findings in the US population from the Third National Health and Nutrition Examination Survey, 1988-1994. Arch Intern Med. 2003;163:427–36. [PMC free article] [PubMed] [Google Scholar]

3. Levey AS, Andreoli SP, DuBose T, Provenzano R, Collins AJ. CKD:common, harmful, and treatable--World Kidney Day 2007. Am J Kidney Dis. 2007;49(2):175-179.

4.Scheffel RS, Bortolanza D, Weber CS, Costa LA, Canani LH, Santos KG, et al. [Prevalence of micro and macroangiopathic chronic complications and their risk factors in the care of out patients with type 2 diabetes mellitus]. Rev Assoc Med Bras 2004; 50: 263-267

5.Ardern CI, Katzmarzyk PT, Janssen I, Church TS, Blair SN. Revised Adult Treatment Panel III guidelines and cardiovascular disease mortality in men attending a preventive medical clinic. Circulation 2005; 112: 1478-1485.

6.Kolovou GD, Anagnostopoulou KK, Salpea KD, Mikhailidis DP. The prevalence of metabolic syndrome in various populations. Am J Med Sci. 2007;333:362–71. [PubMed] [Google Scholar]

7.Shah SV, Feehally J. The Third World Kidney Day: looking back and thinking forward. Am J Kidney Dis. 2008;51(3):349-352.