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Research Article

**PREVALENCE AND MANAGEMENT OF DIABETIC
NEPHROPATHY**

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Received: 12 March 2017**Accepted:** 26 March 2017**Published:** 28 March 2017**Abstract:**

Background: Diabetic nephropathy being the leading cause of kidney transplant also affects major vital organs of the body. It increases the risk of mortality in diabetic patients along with hypertension, cardiopathy and other concurrent diseases. The main aim of study was to observe management and prevalence of nephropathy among the diabetic patients.

Methods: An observational study was conducted during August-2016 to September- 2016 in different hospitals of Lahore. 50 patients of diabetic nephropathy were randomly selected and data was collected by filling questionnaires from patients. Collected data was analyzed and results were presented in the form of graphs and tables.

Results: Results showed that the prevalence of diabetic nephropathy depends on socioeconomic background of the patients, as 42% of the patients were unemployed, 40% smokers, with a family history of diabetes type-II. The medications prescribed mostly consist of antihypertensives, antidiabetics and 70% of ACE inhibitors and Angiotensin-II. 88% of the patients found ACE inhibitors more beneficial than their previous medications as they had very few side effects, and 60% patients had HbA1c value in range due to use of regular medication. 56% of patients used tablets while 43% used injections.

Conclusion: It was concluded that prescriptions of nephropathy patients indicated more ACE inhibitors. NSAIDs should be avoided in nephropathy as they increase GFR rate and affect kidney badly.

Keywords: Diabetic nephropathy, End-Stage-Renal-Disease, Hypertension, ACE inhibitors, Urine protein, GFR.

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INTRODUCTION:

Diabetes has become the most common single cause of end-stage renal disease (ESRD), this is due to the facts that diabetes, particularly type 2, is increasing in prevalence and diabetic patients now live longer. The earliest clinical evidence of nephropathy is the appearance of low but abnormal levels (≥ 30 mg/day or $20 \mu\text{g}/\text{min}$) of albumin in the urine, referred to as microalbuminuria [1].

The effect of ACE inhibition on diabetic nephropathy demonstrated that captopril reduced the rate of renal failure, end-stage renal disease (ESRD), and death in patients with IDDM and nephropathy [2].

Albuminuria is an established risk marker for both cardiovascular and renal outcomes. It can be reduced with drugs that block the renin-angiotensin system (RAS) [3].

Hyperglycemia induces renal damage directly or through hemodynamic modifications. It induces activation of protein kinase C, increased production of advanced glycosylation end products, and diacylglycerol synthesis. In addition, it is responsible for hemodynamic alterations such as glomerular hyperfiltration, shear stress, and microalbuminuria [4].

It is suggested that the possibility that aldosterone blockade may represent optimal therapy for patients with early diabetic nephropathy. These studies suggest that treatment with an ACE inhibitor to suppress aldosterone synthesis is not adequate and that aldosterone blockade in addition to ACE inhibition has additional benefit in the prevention of organ damage [5].

Despite modern treatment and self-monitoring of blood glucose, young adult patients with diabetes may still develop renal involvement during the first 10 years of diabetes duration. Inadequate HbA_{1c}, high blood pressure, and type 2 diabetes appear to be risk markers for early occurrence of diabetic nephropathy [6]. The effect of early aggressive antihypertensive treatment on kidney function in diabetic nephropathy, the glomerular filtration rate (GFR) decreased significantly and the urinary albumin excretion rate and arterial blood pressure rose significantly [7].

Microalbuminuria and hypertension are risk factors for diabetic nephropathy. Blockade of the renin-angiotensin system slows the progression to diabetic nephropathy in patients with type 1 diabetes, but similar data are lacking for hypertensive patients with type II diabetes [8].

Combination therapy with angiotensin-converting-enzyme (ACE) inhibitors and angiotensin-receptor

blockers (ARBs) decreases proteinuria. The use of combination therapy with an ACE inhibitor and an ARB in patients with proteinuric diabetic kidney disease does not provide an overall clinical benefit because it shows some adverse events like acute kidney injury and hyperkalemia [9].

Endogenous advanced glycation endproducts (AGEs) include chemically crosslinking species (glycotoxins) that contribute to the vascular and renal complications of diabetes mellitus (DM). On the basis of the data presented, appropriate measures to limit AGE intake, such as eliminating those foods or modes of cooking associated with the highest AGE content, may greatly reduce the already heavy burden of these toxins in the diabetic patient [10].

For the diabetic patients lead to kidney disease should have to control the blood glucose level, blood pressure and blood creatinine level, when fails to control these symptoms naturally the medicine are taken to control B.P such as antihypertensives, ACE inhibitors which includes captopril, enalapril [11].

Diabetic nephropathy occurs in approximately one third of individuals with insulin-dependent diabetes mellitus (IDDM), recent studies suggest that a similar proportion of non-insulin-dependent diabetes mellitus (NIDDM) patients develop this serious complication as well. Of the many risk factors identified in the pathogenesis of nephropathy, hemodynamic alterations have been particularly well studied. Increases in glomerular filtration rate (GFR), largely driven by increases in plasma flow and glomerular capillary pressure [12-13].

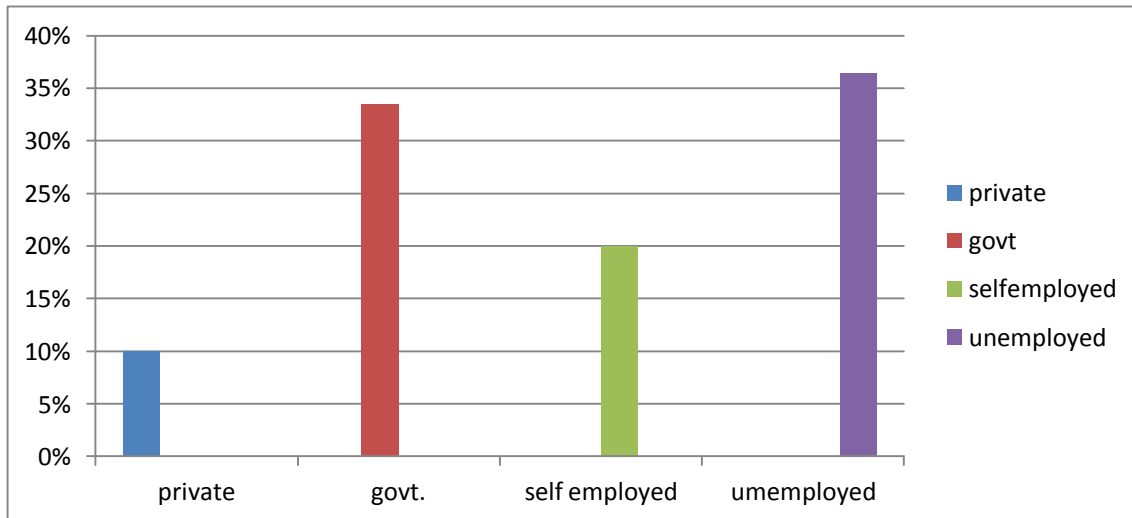
MATERIALS AND METHODS:

A Descriptive observational study was conducted at nephrology/urology wards of Sir Ganga Ram Hospital and Services Hospital Lahore, Pakistan. The duration of study was 2 months (August 2015-September 2015) and 50 patients undergoing treatment for diabetic nephropathy in ward and outpatient were randomly included as subjects for this study.

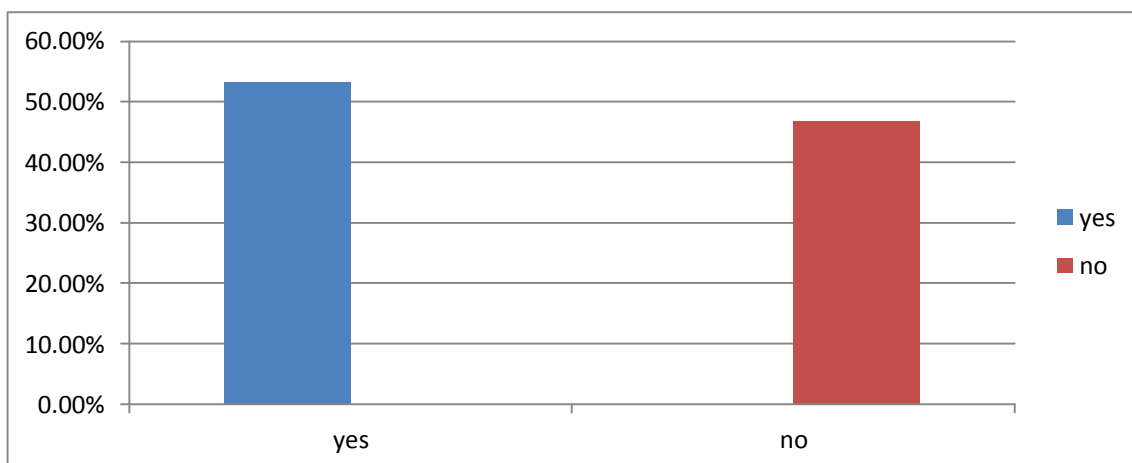
A data collection form was designed to collect the information from the nephropathic patients. Data collection form covered the different aspects regarding patient's demo-graphic information, past medical history, family history, medication history, affect of smoking on the disease, management of diabetes, life style and dietary changes to control diabetic nephropathy and other complications associated with it. Verbal informed consent was taken and confidentiality of patient information was maintained. Collected data was recorded in data collection form. The descriptive statistics was applied using Microsoft Excel® and the frequency and percentages were calculated and results were expressed in tables and figures.

TABLES:

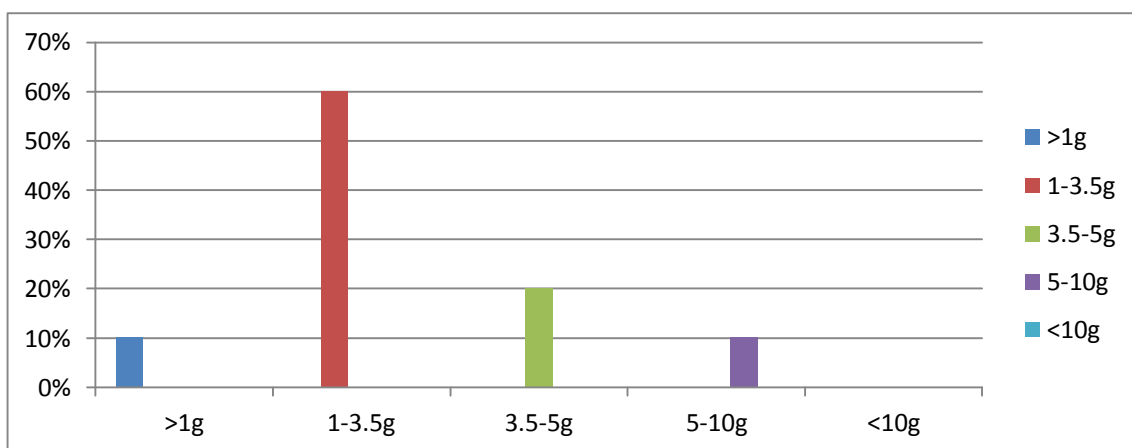
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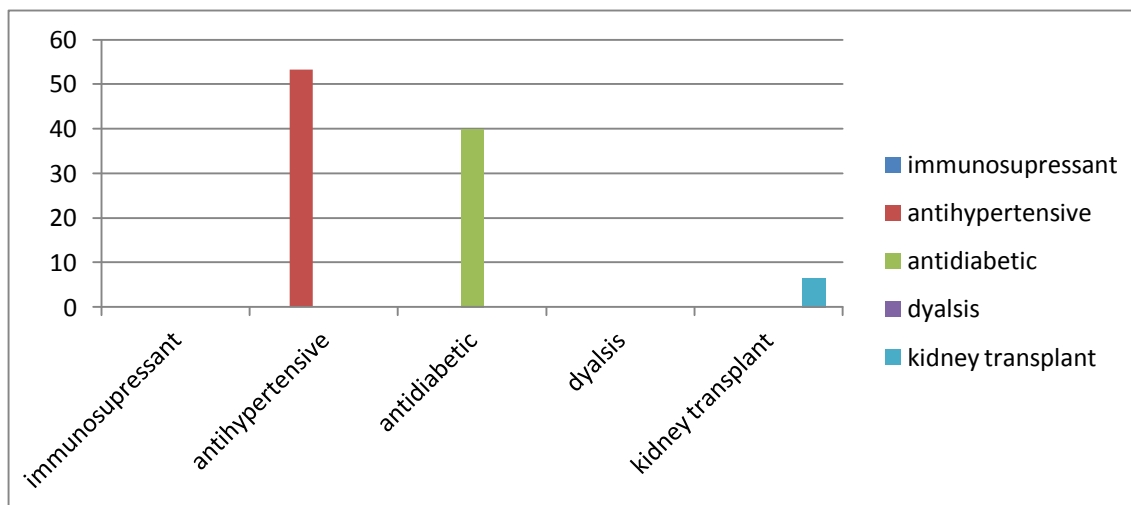
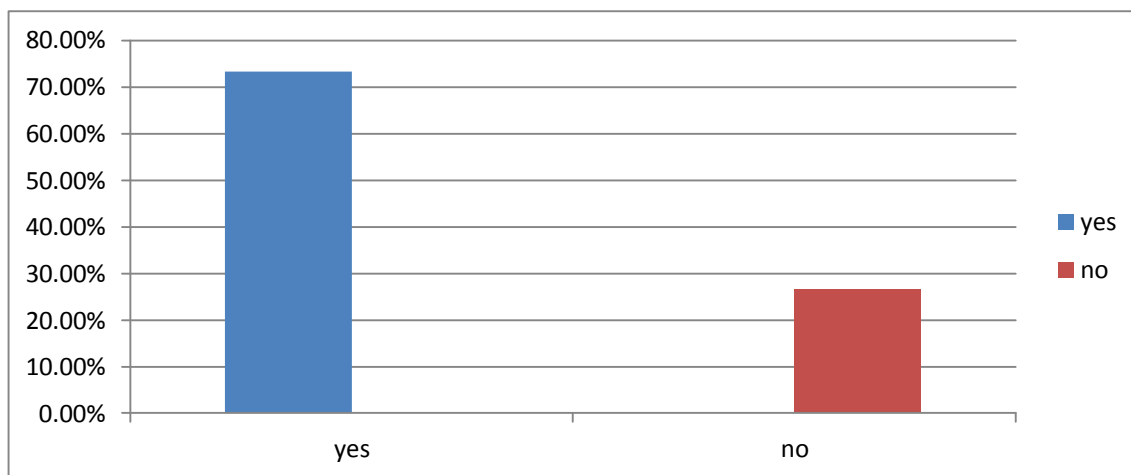


Family history



Urine protein :



Medication prescribed:**ACE inhibitor prescribed:****RESULTS:**

As table 1 indicate socioeconomic status of the patients as 10% were private employees 33.5% government 20% self employed and 36.5% were unemployed. 53.3% patients were with a family history of diabetes. On urine analysis the 60% of patient have 1.3g of protein in their urine and only 10% have urine protein between 5-10g.

The patient encountered, high level of antihypertensive prescription was observed with 40% antidiabetic and 6.6% were on verge of kidney transplant. ACE inhibitors being very effective pharmacologically been prescribed to a great number of patients along with anti diabetic. Among the patients of diabetic nephropathy 73.3% patients were prescribed ACE inhibitors by their health care provider.

DISCUSSION:

Diabetic nephropathy is the damage of kidney due to high level of sugar in diabetic patients. This may result in dialysis or kidney transplant.

A survey was conducted on patients having diabetic nephropathy consisting of two parts i.e

- Demographics of patient
- Management of disease

More of the patients were unemployed as the study was conducted in government hospital in Lahore. Only a small number were self employed stating low to middle class of people in the study.

The educational background was also not very strong as only 30% of patients went to college other were just primary pass or illiterate. Only 10%

have attended the university showing a low socioeconomic status of the people under observation having a lack of knowledge about the disease its symptoms and preventions.

Majority of the patients have a family history of diabetes and were suffering from almost more than 5years. It was observed that type 2 diabetes was more common among the patients attended and shows a hereditary behavior among the patients.

As one of the major indication of diabetic nephropathy is high level of protein in urine so most of the patients have their urine test and RFT done. The lab results indicated high level of protein and cretenine in their urine being a major indication of nephritic damage. Diabetes not only damage kidney but also other organs. It is a major cause of hypertension. 80% of patients encountered have concurrent hypertension, 12% have cardiopathy and 8% have problem of numbness.

Sugar level maintenance and regular check is very helpful in preventing kidney damage most of the patient observed have checked their sugar level regularly and found it very helpful in improvement of health and disease.

It was also found that smoke worsen the disease yet 40% people said that they smoke but are trying to quit which is a major percent of patients observed smoking and is aggravating their symptoms. Most of patients experience symptoms which include increase urination at night increase blood pressure and in worse cases blood in urine which include only 8% of the patients interviewed

The medication prescribed; largely consist of antihypertensive, antidiabetic and 70% of ACE inhibitors and angiotensin 2. 88% of the patient finds ACE inhibitors more beneficial than their previous medications as they have very few side effect and suits majority of patients. Antidiabetic is to control their sugar level that generally include metformin. Whereas ACE inhibitors decrease the level of protein in urine and can prevent or slow the progression of diabetic-related kidney disease. HbA1c is an indicator of long term sugar level monitoring in body and people who required long term sugar level history is indicated by HbA1c lab test. 60% patients have HbA1c value in range due to use of regular medication. The route of administration include; 56% tablets and 43% of patients using injections.

In Pakistan the role of pharmacist as a consultant is not yet very defined and people do not ask them for any advice relating medication and solely depends on their physician. In the survey conducted no patients have, asked for pharmacist advice and do not consider it helpful.

CONCLUSION:

Prescription trends of nephropathy patients indicated more ACE inhibitors due to their more therapeutic effects and very few side effects. NSAIDs should be avoided in nephropathy as they increase GFR rate and affect kidney badly. So, no medication should be taken without the consultation of physician.

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