

# Diabetes is the Leading Cause of ESRD in Haemodialysis Patients

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## Abstract

*Diabetes is one of the leading causes of ESRD and the no of diabetes patients is increasing day by day. In the developed world it is the first and foremost cause of renal failure. However in the developing countries it has been considered as second most common cause after GN. This study was a cross sectional study conducted during Oct 2010 to Sept 2011, in the dept of Nephrology, Dhaka Medical College and Hospital to determine the cause of renal failure with specific object to find out the leading cause of ESRD among the Haemodialysis patients. This study found Diabetes as the leading cause of ESRD accounting 44.1% of whole population.*

**Keywords:** Diabetes, ESRD, Haemodialysis

## Introduction

Diabetes is the most common cause of kidney failure, and nearly 180,000 people are living with kidney failure as a result of diabetes and accounting for nearly 44 percent of new cases.<sup>1</sup> Even when diabetes is controlled, the disease can lead to CKD and kidney failure. Nearly 24 million people in the United States have diabetes, each year in the United States, more than 100,000 people are diagnosed with kidney failure.<sup>2</sup> Diabetic Nephropathy (DN) is the single most important cause of end stage renal disease (ESRD) in Europe also.<sup>6</sup> Currently India has the largest number of diabetic individual-even more than USA and China. It was estimated that there were 30 million diabetes in India and the no will increase to 80 million by 2030. People with kidney failure undergo either dialysis, or transplantation. Most U.S. citizens who develop kidney failure are eligible for federally funded care. In 2005, care for patients with kidney failure cost the United States nearly \$32 billion.<sup>1</sup>

There is no cure for diabetic nephropathy, and treatment is lifelong. Around 20 to 30 per cent of people with diabetes develop diabetic nephropathy, although not all of these will progress to kidney failure. A person with diabetes is susceptible to nephropathy whether they use insulin or not. The risk is related to the length of time the person has diabetes.<sup>3</sup>

People with diabetes are also at risk of other kidney problems, renal artery stenosis or renovascular disease. It is an important cause of morbidity and mortality and it is the leading cause of premature death in young diabetic patients.<sup>4</sup> It is now the most common cause of end stage renal failure in developed countries. As it is found with other microvascular and macrovascular complications, management is frequently difficult and the benefits of prevention are substantial.<sup>3</sup> Diabetic nephropathy is one of the most serious complications in diabetes and proteinuria is associated with an enormously excess mortality and high incidence of severe

non-renal complication. According to Friedman<sup>3</sup>, diabetes is the genetic disease that ranks first as a cause of end stage renal disease in adults. As increasing numbers of diabetic patients survive the earlier hazards of the disease, more will live long enough to develop renal failure that robs the sufferer and society of years of vigorous and productive activity and put a heavy burden upon the health services that provides expensive forms of the therapy. Until prevention of diabetes or diabetic complication is possible, diabetic nephropathy will occur and diabetic patients will need active treatment for their uremia.

In Bangladesh diabetic nephropathy was the second common cause of ESRD after Glomerulonephritis (45%), accounting for about 34% of cases.<sup>6,10</sup> Thus it is important to re evaluate diabetes as a cause of ESRD.

## Objective

To detect the cause of renal failure in haemodialysis patients with a specific object to find out the leading cause of renal failure.

## Method

This was a cross sectional study done in the department of nephrology during Jan 2010 to Sept 2010. All the patients of Haemodialysis unit were invited to participate in the study. Informed written consent was obtained from each patient who were willing to participate in the study. The ESRD patients who were getting dialysis were included in the study. 118 patients were included in the study. ESRD was defined by permanent and irreversible loss of renal function requiring renal replacement therapy. The cause of renal failure was determined by detailed history, through clinical examination and investigations. The causes of renal diseases were defined by following criteria. Diabetes Mellitus (DM) [Long history of diabetes, Documentation of diabetic retinopathy, Presence other diabetic complications, Documentation of insulin and oral hypoglycaemic use. Glomerulonephritis (GN)

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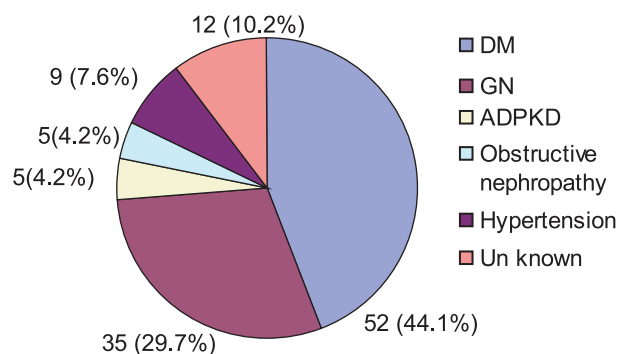
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was diagnosed by Suggestive History, Previous documentation (biopsy and treatment history). Hypertension (HTN) was addressed by Long history of HTN, History or documentation of antihypertensive use, Absence of other disease criteria. Obstructive Nephropathy Suggestive history, Investigation findings of stone, stricture, hydronephrosis and from previous documentation. Autosomal Dominant Polycystic Kidney Disease (ADPKD): Family history, Examination: Bilaterally palpable kidney, Investigation: Multiple cysts in both kidney as per ravine criteria. Unknown Cause of renal failure could not be defined as per above mentioned criteria.

### Results:

Out of 118 patients age 18-75yrs. Gender male 70 and female 48 with male female ratio 2.5:1. The average duration of haemodialysis was 9 months. DM was found 44.1%. GN was found 29.7%. Hypertension was found 7.6%. Both the ADPKD and obstructive nephropathy were found 4.2% and 10.2% were due to unknown aetiology. Among the diabetic patients the average duration of diabetes was 10.6 years with a range 4.5 to 21 years. All most all patients received antidiabetic agent during the course of their illness with oral 43% and 76% (multiple responses) insulin. At the stage of ESRD 58% do not require anti diabetic agents. Diabetic retinopathy was found in 48.4% population, Peripheral neuropathy 31%, diabetic foot 8%, coronary artery disease 62%, Stroke 12%, peripheral vascular disease 17%.



**Fig.-1:** Pie diagram showing the cause of ESRD of the study patients.

### Discussion:

In the current study diabetes was the leading cause of renal failure and the second common cause was GN. Which was almost similar to other studies. According to (USRDS2007) DN 43.8%, HTN 26.8%, GN 7.6%, Cystic disease 2.3%, Urologic disease 2% and others 17.5%.<sup>1</sup> A changing trend of leading cause of ESRD might be due to increase life

expectancy in diabetes patients due to active management causing them to suffer from diabetes for prolonged duration thus they are susceptible to more diabetic related complications. Moreover successful management of glomerulonephritis due to early detection and treatment caused decreased number of ESRD due to Glomerulonephritis origin.

Though the HTN was the second cause of ESRD according to USRDS, in our study GN was next to DN. Progression to advanced nephropathy takes place 4 to 6 years of macroalbuminuria which reaches to end stage renal disease (ESRD) requiring renal replacement therapy (RRT) in next 1 to 3 years. The cost of any form of RRT (either transplantation or dialysis) is very high and in the existing circumstances, less than 5% ESRD patients can avail this treatment and more than 95% dies without treatment in Bangladesh.<sup>6</sup> Furthermore, ESRD from diabetic nephropathy once on RRT, mortality is 1.5 to 2.5 times higher than non-diabetic patients, mostly due to increased cardiovascular mortality.<sup>9</sup>

Less than 20% of diabetic patients survive on dialysis after 5 years and even on RRT, the prognosis of ESRD due to diabetic nephropathy is worse than any other cause of ESRD. There has been steady improvement in the outcome of these patients over past decade, but the statistics remain dismal, which highlights the urgency to treat this particular group of patients. That is why, it is of utmost importance to prevent or at least delay the progression to ESRD from diabetic nephropathy.<sup>8</sup>

### Conclusion:

Diabetes is the leading cause of renal failure in haemodialysis patients accounting 44.1% of ESRD population, like other developed countries but the disease can be successfully controlled by different measures. We should be more cautious in dealing these group of population to prevent progression into ESRD.

### Limitation:

This was a single centre study and it was conducted over a small period and the sample size was small.

### Recommendation:

A large multi center study should be conducted to verify the presence of diabetes as a leading cause of ESRD and rigorous control of diabetic and care should be launched from the early stage of diabetes to prevent further progression.

### Conflict of Interest : None

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