
Evaluation of Diabetic Patients on Maintenance Hemodialysis: Single Center Experience

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Introduction

Type 2 Diabetes is one of the fastest growing epidemics. Worldwide, an estimated 146 million people have this disease and by year 2010 the prevalence is expected to increase twofold (1). Patients with type 2 diabetes are characterized as having high cardiovascular morbidity and mortality, particularly in those with albuminuria (2,3,4). Nephropathy, which occurs in approximately one third of type 2 diabetic patients is the single most important cause of end stage renal disease (ESRD) (5). Indeed, diabetic nephropathy (DN) in both Western and Asian counties constitutes approximately 40% of new patients receiving renal replacement therapies (6). In the United States, type 2 diabetic nephropathy is also the principal cause of the increase in incidence and prevalence of ESRD (4). In the USA number of diabetic patients on maintenance hemodialysis (HD) is increasing every year for 9%. Mortality among patients receiving chronic HD is estimated to be 21-25% per year, with the majority of deaths secondary to cardiovascular causes. Mortality in patients with diabetes mellitus (DM) is 1.5 to 2.5 times bigger than non diabetic patients so less than 20% of patients with DM on maintenance HD survive more than 5 years. Increased mortality is a result of a number of cardiovascular changes, which are acquired in preterminal period of chronic renal failure (7). Therapy is very expensive and with a lot of complications. In the USA health expenditures due to DM and diabetic complications were estimated on the amount of 100 billion dollars in 1995. This is greater than the total health budget in 2001 for a country like Italy (8). Remarkably in the USA as much as 2 billions dollars is spent on dialysis treatment. In situation where health expenditures are alarming and phenomenon continuous to be on the rise prevention is absolutely priority.

In the Republic of Macedonia in different centers, DM is a reason for ESRD up to 15% (9). On the average, between 10-15% of patients with ESRD are caused by DM at the Department of nephrology, Clinical Center in Skopje.

Aim

The aim of the present study is to evaluate diabetic patients on maintenance HD at the Department of nephrology, Clinical Center Skopje, and to get an overview.

Patients and Methods

Data from medical histories of 31 (15.4%) patients, male 45.2% and female 54.8%, with DM on maintenance HD were analyzed from total number of 201 patients on maintenance HD program at the Department of Nephrology Skopje. All patients received the same treatment. Standard bicarbonate or acetate HD was offered. Dialysis duration was 12h/week. Polysulfonic membranes (E3H, E4H, F5HPS and F6HPS; Hemomed Hemofarm) were used. Most of the machines were Gambro AK 90, Gambro AK 95 and Gambro AK100 (Gambro, Lund, Sweden). The water for HD was processed by reverse osmosis. The blood flow rate was 250-280ml/min, and the dialysate flow was 500ml/min. Most common vascular access was Cimino-Brescia arterio-venous fistula (80.5%); femoral catheters were used in 4 (13%) patients and subclavia catheters in 2 (6.5%) patients. All patients were recommended diabetic diet and physical activity. The day 31.12.2002 was taken as a critical day for data evaluation of patients on HD with DM. Data were collected by specially prepared questionnaire.

Results

We have found hypertension in 85.7% with its average duration of 11.9 (\pm 8.9) years. Familiar history of diabetes was 43.3% and of hypertension 30.1%. Smokers were 12.9% and alcohol consumers 3.2%. Therapy of hypertension was: Ca antagonists in 47.8%, ACE inhibitors in 26.1%, alpha blockers in 8.7%, alpha in combination with beta blockers in 4.3% and without therapy 13. We found the following laboratory findings during HD: fasting glycemia: 10.5 \pm 5.6 mmol/L; BUN: 26.4 \pm 5.6 mmol/L; serum creatinine: 639.4 \pm 28.5 mmol/L; serum cholesterol: 4.8 \pm 1.35 mmol/L; serum tryglicerides: 2.8 \pm 1.8 mmol/L. Macrovascular diabetic complication before HD was less than 35%, with increasing during the HD treatment more than 50%. The average period of the treatment of patients with DM on maintenance HD was 35 months (Fig.1). 22.5% of patients had DM type 1, and 77.5% had DM type 2, from which 32.3% were on diet and oral anti hyperglycemic agents and 45.2% were on insulin therapy with its average duration for 11 years. The average age of patients with DM was 59.3 \pm 10.87 years. Average body mass index was 24.53 \pm 4.57 kg/m². Most common complications in patients with DM on maintenance HD (Fig 2.) were: hyper-

tension in 85.7%, cerebrovascular insult in 16.5%, angina pectoris 6.45% and myocardial infarction in 6.45%

Fig 1: Average time on maintenance HD in patients with DM

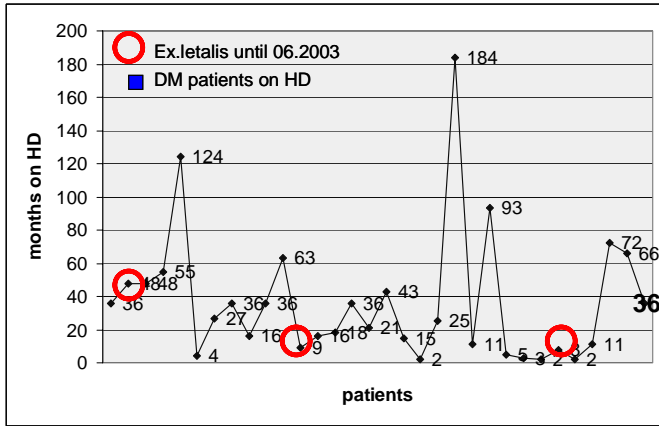
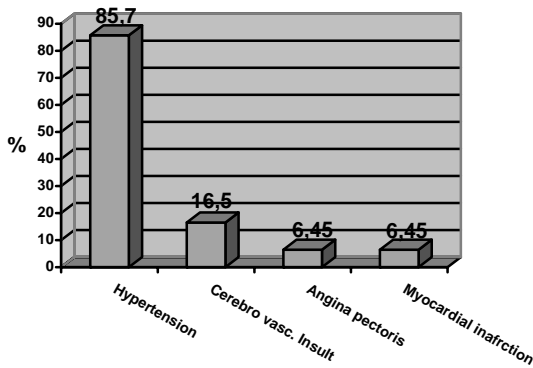


Fig.2: Percentage of most common complications in patients with DM on maintenance HD



Discussion and Conclusion

The number of patients with DM on maintenance HD is rapidly increasing. These patients have smaller survival rate than patients on maintenance HD with other diagnosis. There is no early detection of diabetic nephropathy and the patients have been hospitalized with end stage of renal failure and cardiovascular complications. There is obvious need for team treatment of these patients of diabetologists, nephrologists, cardiologists, ophthalmologists and neurologists. The end point is better medical care and better quality of life in diabetic patients on maintenance hemodialysis.

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