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Research Article

### STUDY OF PATIENTS WITH NEWLY DIAGNOSE MATURITY ONSET DIABETES MELLITUS AND ITS RELATED COMPLICATIONS: A PROSPECTIVE STUDY

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**Abstract:**

**Aim:** The purpose of this study was long-term prospective follow-up of patients with newly diagnosed diabetes to monitor the appearance of complications related to the degree of control and type of treatment.

**Place and duration:** In the Medicine Unit II of Nishter Hospital Multan for three years duration from January 2017 to December 2020.

**Methods:** In a prospective study involving 332 patients with newly diagnosed diabetes in adulthood, the incidence of complications was monitored for more than 2 to 3 years. The groups included 97 patients on diets, 209 oral hypoglycemic drugs and 26 patients with insulin. About 10% of patients had evidence of early retinopathy at the time of diagnosis.

**Results and Conclusion:** During the follow-up period, the incidence of myocardial ischemia was relatively higher in the group that was also the largest group and received oral medications where adverse events were relatively high at the time of diagnosis. As demonstrated by retinopathy, the overall incidence of microvascular diseases was similar in all control groups. When complications related to blood glucose control were studied, the degree of control did not affect the relative incidence of myocardial ischemia in each treatment group. However, diabetes control had a positive effect on the incidence of microvascular diseases in the diet or insulin treatment groups.

**Key Words:** Diabetes, Hypertension, ischemia.

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**INTRODUCTION:**

Diabetes is characterized by hyperglycemia and progressive vascular disease leading to increased morbidity and mortality. Following the discovery of insulin and oral hypoglycemic agents, both short- and long-term complications could be effectively controlled<sup>1-4</sup>. The exact relationship between blood sugar control and risk of complications is uncertain. The results of the university's diabetes program (UGDP, 1970) showed that the use of oral hypoglycemic agents increased the incidence of vascular complications. Observation is important in the treatment of diabetes<sup>5-6</sup>. The diabetes spectrum is currently being studied in Pakistan and the first observations were recorded (Haider and Obaidullah, 1980). The purpose of this study was long-term prospective follow-up of patients with newly diagnosed diabetes to monitor the appearance of complications related to the degree of control and type of treatment<sup>7</sup>.

**MATERIAL AND METHODS:**

This prospective study was held in the Medicine Unit II of Nishtar Hospital Multan for three years duration from January 2017 to December 2020. Selected patients were diagnosed with new untreated diabetes with symptoms for less than a year. 584 patients were examined. The current analysis treats only 332 patients who have completed at least 3 years of satisfactory follow-up. Each patient has undergone initial assessment and testing. Each patient underwent a full annual physical examination and laboratory tests, and new

Act (Blackburn, 1969). Cholesterol estimates were made using the method of Abell *et al.* (1952).

**RESULTS:**

**Table-1: Age and Sex Distribution of 332 Patients with Newly Diagnosed Diabetes Mellitus in Various Treatment Group**

Age (year)	Diet (97)		Oral Anti-Diabetic (209)		Insulin (26)	
	Male	Female	Male	Female	Male	Female
<30	1	2	4	8	3	1
31-40	13	21	19	38	5	8
41-50	12	23	27	54	3	2
51-60	11	13	13	40	1	3
61 and Above	-	1	4	2	-	-
Total	37	60	67	142	12	14

Table I shows the distribution of patients by age and sex in different treatment groups. The diet included 97 patients (37 men and 60 women), 209 (67 men and 142 women) in oral anti-diabetic drugs and 26 (12 men and 14 women) undergoing insulin therapy. Most patients in each group were between 31 and 50 years old.

complications were noted during the follow-up period.

Changes in blood pressure, fundus, ECG heart size, peripheral pulse, renal function and neurological examination were observed, and the following were noted:

- 1. Death.**
- 2. Cardiovascular events.**
  - a. ECG changes in ischemia: new changes.
  - b. Myocardial infarction: as a new event or worsening of a previous clinical condition.
  - c. C.V.A. (Cerebrovascular accident).
  - d. Peripheral vascular disease.
- 3. Microvascular disease.**
  - a. Retinopathy: new lesions or deterioration in the class.
  - b. Albuminuria: more than a scar with no other cause, such as an infection.
- 4. Neuropathy**

All recruited patients were instructed to control diabetes through diet, and the response was evaluated after 4-6 weeks. Those who were not controlled by diet had the option of a sulfonylurea or insulin. Ninety-seven patients continued their diet, 209 were treated with a sulfonylurea and 26 injected with insulin. Patients who did not undergo diet therapy at any stage during follow-up and switched to a sulphonylurea / or insulin were counted in the treatment group at the time of assessment. All biochemical tests were carried out using the method described by King and Wooten (1964). Electrocardiograms were interpreted in accordance with the Minnesota

**Table-2: Distribution of Patients According to the Clinical and Laboratory Findings at the Time of Diagnosis in the 3 Treatment Groups**

Clinical Findings	Diet (97)	Oral Anti-Diabetic (209)	Insulin (26)
Blood Sugar Postprandial > 250mg%	40 (41.2%)	120 (57.6%)	14 (53.84%)
Blood Cholesterol > 250mg%	9 (9.27%)	34 (16.3%)	1 (3.85%)
Obesity <10 of Standard wt.	13 (13.39%)	54 (25.9%)	1 (3.85%)
Hypertension	13 (13.39%)	31 (14.88%)	1 (3.85%)
H/O. Angina	5 (5.15%)	8 (3.84%)	2 (7.7%)
ECG (Ischemic Changes)	7 (7.19%)	33 (15.84%)	-
Peripheral circulatory abnormalities	-	-	-
Retinopathy	9 (9.27%)	23 (11.04%)	3 (11.54%)
Protein urea	7 (7.19%)	20 (9.6%)	2 (7.7%)

Table II shows clinical and laboratory results at the time of diagnosis. The group of patients using oral drugs had a slightly higher incidence of patients with a postprandial blood sugar level of 200% mg, cholesterol 250% mg, obesity (> 10% of standard body weight) and ECG disorders. About 10% of patients had evidence of microvascular changes during assessment.

**Table-3: Distribution of Patients According to New Complications during Follow Up in the 3 Treatment Groups**

Complications	Diet (97)	Oral Anti-Diabetic (209)	Insulin (26)
Myocardial Ischemia	7 (7.21%)	30 (14.4%)	1 (3.85%)
Hypertension	15 (15.45%)	26 (12.48%)	1 (3.85%)
Cerebrovascular Accident	-	1 (0.45%)	-
Retinopathy	9 (9.27%)	19 (9.31%)	3 (11.54%)
Protein urea	6 (6.18%)	10 (4.8%)	1 (3.85%)
Neuropathy	-	3 (1.44%)	-
Deaths	-	4 (1.92%)	-

Table III shows the frequency of new events during the observation period in patients receiving different forms of treatment. Patients taking oral medications had relatively higher clinical evidence of ischemic myocardial disease or ECG. The frequency of microvascular diseases was approximately similar in all groups. Objective results of neuropathy were observed in 3 patients taking oral medications. Four patients with sulfonylureas died of heart failure.

**Table-4: Relationship of Blood Sugar Control on New Complications in the 3 Treatment Groups**

Complications	Diet (97)		Oral Anti-Diabetic (209)		Insulin (26)	
	Good (77)	Poor (20)	Good (95)	Poor (114)	Good (17)	Poor (9)
Deaths	-	-	-	4 (3.5%)	-	-
Myocardial Ichaemia	6 (7.78%)	1 (5%)	12 (12.63%)	18 (15.80%)	1 (5.9%)	-
Cerebrovascular Accident	-	-	1 (1.05%)	-	-	-
Retinopathy	4 (5.20%)	5 (25%)	8 (8.40%)	11 (9.65%)	1 (5.9%)	2 (22.22%)
Nephropathy	2. (2.60%)	4 (20%)	3 (3.5%)	7 (6.1%)	-	1 (11.11%)
Neuropathy	-	-	-	3 (2.60%)	-	-

Table IV shows the relationship between blood sugar control and complications. Diabetic control was assessed based on the average of the last 3 blood glucose readings after the prandial. An average blood sugar level <200mg was considered satisfactory control. Myocardial ischemia was reported in 6 (7.78%) of 97 dietary patients, 77 patients with satisfactory control and in one of 20 patients (5%) with poor control. Among oral drug users, ischemic lesions were found in 12 (12.63%) of 95 well-controlled patients and 18 (15.80%) of 114 poorly controlled oral hypoglycemic patients. One of 17 patients (5.90%) with good control in the insulin group showed ischemic changes.

Those who were poorly controlled by diet or insulin had a relatively higher incidence of retinopathy. In the oral medication group, the frequency of further progression in diabetic retinopathy was equally divided into good and poorly controlled groups. Three cases of neuropathy occurred in inadequately controlled patients taking a sulphonylurea. There were 4 deaths among people whose oral medication was poorly controlled.

**Table-5: Duration of Follow up of 332 Patients**

Duration (Years)	Patients	Percentage
3 to 5	145	43.64
>5 to 7	151	45.4
>7	36	10.89

Table V shows the observation time in 332 patients; 154 patients (43.64%) were followed for 3 to 5 years, 151 patients (45.4%) for over 7 years and 36 patients (10.89%) for over 7 years.

### DISCUSSION:

Despite the presence of insulin and oral hypoglycemic agents to control hyperglycemia in diabetes, chronic vascular complications persist.

The value of blood sugar control is controversial to reduce the incidence of various complications. Opinions of supporters supporting strict control of blood sugar levels are strongly expressed in the political statement of the American Diabetes Association<sup>8</sup>. Cahill *et al*<sup>9</sup>. (1976) believe that there is sufficient clinical and experimental data to demonstrate the benefits of maintaining strict control of blood sugar levels. Siperstein *et al*<sup>10</sup>. (1977) expressed doubts about the relationship between microvascular complications and the degree of hyperglycemia. They warned against excessive insulin use until hypoglycaemic attacks were induced. His views were supported by others (Knowles, 1964; Bondy and Felig, 1971). Data from the University Group Diabetic Program (Goldner *et al*<sup>11</sup>, 1971) showed that lowering blood sugar levels has no effect. This prospective check-up of newly diagnosed diabetic patients was conducted with significant limitations. Patients were randomized to different treatment groups according to clinical needs<sup>12</sup>. Patient compliance with treatment and prescription was indirectly performed by cross-examination, and the number of patients in different groups was not balanced.

Myocardial ischemia developed more frequently in patients with oral hypoglycemic drugs, but clinical results indicating this complication were present in this group during the diagnosis<sup>13</sup>. At the time of diagnosis, nearly 10% of diabetics had microvascular disease in the form of retinopathy, and their incidence during follow-up remained the

same in all treatment groups. Some cases of stroke, neuropathy and death have occurred in orally treated patients<sup>14</sup>. The relative incidence of myocardial ischemia was not affected by blood glucose control levels in the three treatment groups. The frequency of retinopathy was significantly higher in poorly controlled patients and lower in patients with well-controlled diet and insulin therapy. In patients taking tablets, the degree of control of blood sugar did not affect retinopathy. The study warns against arbitrary use of oral hypoglycemics, despite their limitations<sup>15</sup>.

### CONCLUSION:

Dietary control and insulin therapy appear to reduce the incidence of microvascular complications. Reducing the impact factors such as hypertension, smoking and hyperlipidemia, along with good blood sugar control, will minimize the risk of coronary heart disease in patients with diabetes.

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