GLYCEMIC CONTROL AND MIGROANGIOPATHY IN NIDDM

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Despite great advances in the past half century in the treatment of diabetes and its complications, morbidity and mortality are largely unchanged. The debilitating complications of diabetes have become a major threat to both the quality and length of life for a diabetic. Epidemiological studies have clearly attested to the dominent contribution by the degree of glycemic control and duration of diabetes mellitus in the causation of diabetic complications in general and microangiopathy in particular. However, the controversy continues over the impact of tight control on the long term complications and many still believe that genetic factors or unknown metabolic factors independent of euglycemia may be major causes of diabetic complications. The present study is aimed to determine whether glycemic control correlated with the presence of microangiopathy in Non-insulin dependent diabetics.

Materials and Methods

Fifty two non-insulin dependent diabetics consisting of 44 males and 8 females were studied. There age ranged between 55 and 77 years and the duration of diabetes was more than 20 years. Their glycemic status was assessed by estimating the fasting blood sugar (venous whole blood) and an estimation of the glycosylated haemoglobin (GHb) (by calorimetric method). A fasting blood sugar level of more than 120 mg% and a GHb value of more than 8.5% was taken as an index of poor glycemic control.

The presence of retinopathy was established by a fundus examinations after full pupillary dilatation. Nephropathy was established by the presence of persistant proteinuria of more than 500 mg/24 hours on more than two occasions.

Results

Of the 52 NIDDM subjects studied 9 patients had microangiopathy forming 17.3% of the total. While all the nine had retinopathy, only three patients had nephropathy in addition. None of them were in renal failure (Table-1).

Table I
Prevalence of Microangiopathy
n=52

Microangiopathy	Number	Percentage
Total Microangiopathy	9	17.3
Retinopathy	9	17.3
Nephropathy	9	5.7
Retinopathy + Nephropathy	3	5.7

Five NIDDM subjects out of the 9 with microangiopathy were in a state of poor glycemic control as assessed by fasting blood and GHb (55.5% of the total). In the remaining 43 subjects without microangiopathy 25 were in poor glycemic control (53.1%) (Table II). Analysis of the results revealed that there was no statistically significant difference in the glycemic status of those with and without microangiopathy (Table-III). In both the groups the mean of the fasting blood sugar levels and the means of the GHb levels were incidental.

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Table II
Prevalence of Poor Glycemic Control

	Diabetics with poor control	
	Number	Percentage
Diabetics with Microangiopathy (n=9)	5	55.5
Diabetics without Microangiopathy (n = 43)	25	58.1

Discussion

Recent advances in the management of diabetes mellitus have provided means to achieve normal or near normal glucose control for extended periods of time. This achievement has provided an opportunity to examine the controversy regarding the role of hyperglycemia and "tight" control in the development and progression of diabetic complications.

We attempted to study the correlation between glycemic control and microangiopathy in a group of 52 NIDDM subjects with similar duration of diabetes (more than 20 years). Prevalence of microangiopathy was found to be 17.3% of the total number studied. There was no statistically significant difference in the glycemic status of the two group of subjects-one with microangiopathy and the other without microangiopathy.

The issue of "tight" control in diabetes is important because of the impact of the disease and its long term consequences. Though the primary causal factor responsible for the development of diabetic complications is prolonged exposure to hyperglycemia, it is now widely accepted that diabetic patients with similar duration of diabetes and similar degree of hyperglycemia differ markedly in their subceptibility to complications. The consensus of opinion is that microangiopathy in diabetics is the result of interaction of many factors. These factors, apart from duration of

Table III
Glycemic Status Vs Micro-angiopathy

Glycemic status	Diaetics without Micro- Angio-pathy n=43	Diabetics with Micro-Angio pathy n = 9	Statistical significance
Fast Blood Sugar (in mgm%)	147.7 + 43.56	153.77 + 44.46	N.S
Glycosylated Haemoglobin (%)	9.33 2.21	9.48 + 1.68	N.S

(Statistical Analysis by STUDENT 't' Test)

diabetes and hyperglycemia include genetic susceptibility, the enzymatic and non enzymatic glycosylation of proteins, hyper and hypo insulinemia, altered blood rheology, abnormal lipo proteins and the potential role played by oxidative stress.

Hyperglycemia is only the tip of the Iceberg in the syndrome complex of diabetes mellitus. While the early functional abnormalities of retina and the kidney can be reserved with tight control of hyperglycemia it has not been possible to halt the progression of advanced complications by “tight control”.

References

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