Multicentric Trial of Diabecon (D-400) – A Horbomineral Preparation on Lipid Profile in Diabetes Mellitus

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INTRODUCTION

The prevalence of dysilpidaemia is much more common in NIDDM as compared to IIDM. Diabetes begins with an excess of fat and diabetics die from an excess of it [1]. Atherosclerosis accounts for 80% of all diabetic mortality [2]. About 75% of altherosclerotic diabetic mortality is the consequence of coronary atherosclerosis; the remaining 25% results from a combination of accelerated cerebral vascular disease, peripheral vascular disease or both. Compared to non-diabetic patients the incidence of CAD is twice in men with diabetes and four times in diabetic women [3]. Similarly, cerebral vascular and peripheral vascular diseases increased four to five fold respectively in diabetic patients compared with non-diabetic individuals [2]. Diabetes is the most common cause of heart disease in young people [4]. Obesity, another inherent feature of NIDDM may contribute to the development of hypertriglyceridaemia and has more adverse effects on lipids and lipoproteins in NIDDM, than in IDDM [5]. The most common abnormality in diabetes is hypertriglyceridaemia, elevated very low density lipoproteins (VLDL) and decreased HDL levels [6]. NIDDM subjects have higher triglyceride levels than the general population and these levels are probably higher than in individuals with the same degree of obesity who do not have diabetes. The lower HDL cholesterol level observed in NIDDM patients is related to higher triglyceride levels, degree of central
Or intra-abdominal obesity, glucose and insulin levels. One of the determinants of diabetic hypertriglyceridaemia is the over-production of VLDL [7]. The abnormal lipoprotein levels characteristic of NIDDM have also been observed among "prediabetic" individuals, especially lower HDL cholesterol and higher triglyeride levels. Lipoprotein lipase depends on insulin for its full activity and VLDL clearance is reduced in poorly-controlled patients with IDDM. Low density lipoprotein (LDL) levels are also raised in association with poor glycaemic control, but a substantial improvement in blood sugar is required [8].

Diet, exercise and glycaemic control are first-line measures for managing dyslipidaemia in the diabetic patient [9]. These measures, although often beneficial, cannot completely reverse dyslipidaemia, particularly in NIDDM patients [10]. Several drugs have been recommended for treating hyperlipidaemia, but they are associated with a number of side effects.

Diabetes mellitus (Madhumeha) was known to ancient Indian physicians and an elaborate description of its clinical features and effective management appears in Ayurvedic texts. A number of herbs have been known to posses anti-diabetic properties. Diabecon (D-400), a herbomineral preparation whose main ingredients are Eugenia jambolana [11]. Pterocarpus marsupium [12], Ficus glomerulata Gymnema sylvestre [13], Momordica charantia [14], Ocimum sanctum [15] and Shilajeet [16], has been found to effectively lower the blood sugar level in NIDDM patients [17]. It has also been found to reduce serum cholesterol and triglyceride levels in many experimental trials [18].

With the above information, a multicentric study was conducted to evaluate the efficacy of a herbomineral anti-diabetic formulation, Diabecon, on blood sugar and lipid profile in NIDDM cases.

PATIENTS AND METHODS

One hundred and fifteen patients in the age range of 30-70 years who attended the OPD between Dec. ’94 and Aug ’95 at 4 different trial centres were recruited for an open clinical trial of Diabecon (D-400). The protocol was cleared by the respective ethical committees before the commencement of the study and written informed consent was taken from all the patients before recruitment. Patients were selected on the basis of WHO criteria TRC series No. 725 ; 1985. A trial of diet and life-style

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modification alone was given to freshly diagnosed cases for a period of 3 months, falling which they were recruited for the trial. All the patients received Diabecon (D-400) at a dose of 2 tablets t.d.s. for a period of 6 months and lipid profile was assessed initially and after 6 months.

Statistical analysis was done by using unpaired 't' test.

RESULTS

The initial mean serum cholesterol level was 243.60 13.50 mg/dl. An analysis done for 55 patients showed that the triglycerides level was 227.42 22.92 mg/dl and LDL was 175.40 13.50 mg/dl. HDL was 43.61 2.07 mg/dl and VLDL was 45.30 4.50 mg/dl.

In all patients, it was observed that there was a significant reduction in fasting and postprandial blood sugar level, with a significant decrease in total cholesterol, triglycerides, LDL and VLDL levels and a considerable increase in HDL level. At the end of 6 months, the mean total cholesterol was 188.00 2.90 mg/dl ($p< 0.01$), triglycrides level as 153.55 7.70 mg/dl ($p < 0.01$), LDL was 121.00 4.10 mg/dl ($p< 0.01$), VLDL was 33.50 0.89 mg/dl ($p < 0.01$) and HDL was 53.34 2.12 mg/dl ($p < 0.01$) , which confirms the antihyperlipidemic effect of Diabecon (D-400), (Table 1)

Table – 1
Effect of Diabecon (D-400), on lipid profile in diabetics

Parameter	Pre-treatment	Post-treatment
Total cholesterol	243.60	188.00*
(mg%)	13.50	2.90
Triglycerides (mg%)	227.42	153.55**
	22.92	7.70
HDL (mg%)	43.61	53.34
	2.07	2.12
LDL(mg%)	175.40	121.00
	13.50	4.10
VLDL (mg%)	45.30	33.50
	4.50	0.89

*P <0.001, ** P <0.01 as compared to pre-treatment values.

A sense of well being was observed in all patients and none of them complained of any side effects. Metabolic control of diabetes also improved significantly (Table 2).

Table – 2
Effect of Diabecon (D-400), on Blood Glucose and Glycosylated Haemoglobin in diabetics

Parameters	Pre-treatment	Post-treatment
Fasting Blood Glucose	175.96	107.93*
(mg/dl)	6.80	5.32
Post Prandial	233.12	154.18*
Blood Glucose	20.87	8.97
(mg/dl)		
Glucosylated Haemoglobin	10.17	7.80
(n=90) (Percent of HB)	1.56	0.38

* P < 0.001, ** NS – Non significant

DISCUSSION

Dyslipidaemia substantially increases the likelihood of serious cardiovascular problems in NIDDM patients, a population already at high risk of adverse cardiovascular changes associated with hypertension and hyperinsulinaemia [19]. This constitutes an atherogenic profile and in turn may be magnified by qualitative lipoprotein changes in diabetes, such as glycosylation and oxidation [20]. In NIDDM patients, dyslipidaemia of this nature may be independent of glycaemic control. In the consensus statement issued by the American Diabetes Associates, it is noted that efforts to lower blood glucose are necessary but not sufficient to prevent macrovascular complications in most diabetic patients [21]. In view of the above, greater attention must be given to correct dyslipidaemia in diabetic patients who are receiving lipid lowering therapy. Although the beneficial effects of normalising lipids in NIDDM patients have not been studied in terms of reduced CAD morbidity/mortality, correction of dyslipidaemia has been shown to significantly reduce cardiac end points in non-diabetic patients with elevated plasma LDL-cholesterol, TG and low HDL-cholesterol levels [22].

In the present study, a significant reduction in blood lipids was observed at the end of the 6-month study

period. The results of this study demonstrate that Diabecon (D-400) is effective in correcting the two most common lipid abnormalities of NIDDM, i.e. hypertriglyceridaemia and low HDL levels.

A major concern in clinical studies of this nature is the tendency for biochemical parameters to regress towards mean levels. To eliminate this possibility, a 12-week baseline period was established . Trend analysis revealed no significant changes over this period, indicating that the reduction in blood lipids represents a significant change. Body weight did not show any notable change, proving that reduction in TG and TC could be on account of subsequent reduction in both fasting and postprandial blood sugar but not due to the actual effect of the drug. Since Balsamodendron mukul, an important ingredient of Diabecon (D-400), has been proven to be effective in lowering blood lipids, it is possible that the hypolipidaemic action of Diabecon (D-400) may be independent of its usefulness in lowering blood sugar.

No primary prevention trial so far specifically examined the effects of lipid-lowering therapy on macrovascular end points in NIDDM patients. However, improvements in the lipoprotein profiles were associated with a 34% reduction in the incidence of fatal and non-fatal coronary heart disease. What is not required is a long-term study to explore the role of Diabecon (D-400) in the progression of macrovascular disease in NIDDM.

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