Studies on the effect of dry Sundakai (*Solanum torvum*)
powder supplementation on lipid profile, glycated proteins
and amino acids in non-insulin dependent diabetic patients

UMA M. IYER, NIVEDITA C. MEHTA¹, INDRANI MANI &
ULIYAR V. MANI*
Department of Foods and Nutrition, ¹Department of Medicine, M S University of Baroda,
Baroda 390 002, India (*author for correspondence)

Received 15 December, 1990; accepted in revised form 1 May, 1991

Key words: Diabetes mellitus, dry Sundakai powder supplementation, glucose, lipid profile,
glycated proteins

Abstract. The effect of dry Sundakai powder supplementation (7 g providing 1.23 g of crude
fibre) on glycemic control, lipidemic control, total amino acids and uronic acid was studied
on 30 non-insulin dependent diabetes mellitus patients. All the patients were on hypoglycemic
drugs. The above parameters were monitored at day 1, 15 and 30 days. After one month of
fibre supplementation, no significant changes were observed with respect to glucose, lipid
profile, glycated proteins, total amino acids and uronic acid levels in these subjects.

Introduction

The syndrome of diabetes mellitus is characterized by disorders of metabol-
ism of carbohydrate, proteins and lipids due to insulin deficiency and/or
insulin resistance evolving from the interaction of a variety of genetic and
environmental factors. Metabolic disorder manifests itself in its fully
developed form by hyperglycemia, glycosuria, increased proteolysis, ketosis
and acidosis with or without hyperlipidemia [1, 2]. As a result of these
changes in metabolism of glucose, secondary complication such as increased
glycosylation of protein occurs resulting in abnormal metabolism of
glycoproteins [3]. Thus, altered lipid metabolism with changes in basement
membrane collagen are responsible for the secondary complications of
diabetes mellitus which cause most of the morbidity and mortality. In this
connection, various dietary modifications have been used in efforts to
control the condition [4]. Ingestion of large amounts of plant fibres has
become one of the latest nutritional foods and has been strongly advocated
for diabetic patients. Many workers [5–7] have advocated the inclusion of
dietary fibre in the diabetic diet to improve glucose tolerance and to bring down the hyperlipidemia.

Earlier work from this laboratory with wheat bran supplementation [8–10] in diabetic rats and in NIDDM patients indicated no beneficial effect with respect to serum lipids, glycated proteins and collagen metabolism. Apart from wheat bran, leaves like colocasia also have been investigated in hypercholesterolemic rats and were found to be lipogenic in nature [11]. Further studies with curry leaves powder supplementation in NIDDM patients showed no beneficial effects on fasting blood sugar, glycated proteins, lipid profile and total amino acids [12]. Since various fibres from cereals, pulses, fruits and vegetables are being evaluated for either hypolipidemic or hypoglycemic action, an attempt was made with dry Sundakai powder (Solanum torvum) as it is rich in fibre and largely consumed by the South Indian population. Sundakai supplementation was carried out to determine its effect on serum lipid profile, glycated proteins and total amino acids in non-insulin dependent diabetes mellitus (NIDDM) patients.

Materials and methods

Subjects

The diabetic patients were selected from the outpatient diabetic clinic of SSG Hospital, Baroda, with the consent of the patient as well as the treating physician. The study group was comprised of 30 diabetics of the NIDDM type. In all there were 12 males and 18 females. Once the patients were selected, they were kept under observation for a period of 1 week before the supplementation of the diet was started. Neither the drug nor the diet to the possible extent was altered throughout the study period except for the inclusion of Sundakai powder during the supplementation period.

Supplementation

Dry Sundakai was purchased from the local market and then ground in a mixer to a fine powder to a mesh size of 1 mm². This fine powder was given to the patients.

Acceptability trial runs were conducted before actually starting the supplementation. Dry Sundakai powder was tested at 28 g, 21 g, 14 g and 7 g levels. Due to slight bitter taste, the most feasible and acceptable level worked out to be 7 g powder, providing 0.58 g protein, 0.12 g fat, 1.23 g