Efficacy of Tibetan Medicine as an Adjunct in the Treatment of Type 2 Diabetes

Diabetes is the most frequently seen chronic disease in Tibetan medical clinics (1). Ancient texts of Tibetan medicine outline the successful management of diabetes (2). However, there is a paucity of systematic research studies using modern scientific tools to evaluate the efficacy of Tibetan medicine. Therefore, we undertook a study to assess the efficacy of Tibetan medicine when combined with a diet and exercise regimen compared with a diet and exercise regimen alone in controlling the blood glucose and glycated hemoglobin (GHb) in newly diagnosed or untreated type 2 diabetes.

A total of 200 newly diagnosed or untreated type 2 diabetic patients, who were eligible and consented to participate in the trial, were recruited from two branch clinics of the Tibetan Medical and Astrological Institute (TMAI), the Bangalore Branch Clinic in South India and the New Delhi Branch Clinic in north India, from April 1997 to April 2000. The subjects were aged 30–65 years, with a fasting venous plasma glucose (FPG) value between 140 and 250 mg/dl and a postprandial plasma glucose (PPG) value of ≥200 mg/dl. The subjects were willing to follow dietary and lifestyle guidelines. Patients who had an FPG >250 mg/dl, who had a BMI <19 kg/m^2, or who were insulin dependent, were not included in the study. The other criteria for exclusion were hypertension, heart disease, kidney failure, pregnancy, a period of lactation <6 months, history of a blackout episode, or any complaint of vision loss.

At each center, all of the 200 subjects, 136 men and 64 women, were randomized into two groups, the treatment group and the control group. The treatment group was treated with Tibetan medication in the form of powder or pills, as prescribed by a practitioner of Tibetan medicine, in addition to the modification of diet and lifestyle recommended by the American Diabetes Association (3). At least two of four Tibetan medicines (Kyura-6, Aru-18, Yungwa-4, and Sugmel-19) were administered based on each patient's age, sex, personality, pulse, and urine characteristics. Subjects in the control group were treated only with the dietary and lifestyle modification. The study was not blind, and the subjects gave their informed consent. The TMAI Ethics Committee approved the study.

A predesigned proforma was created for each patient. FPG, 2-h PPG, and GHb levels were estimated at baseline, 12 weeks, and 24 weeks. Of the 200 subjects, 136 patients completed 12 weeks of follow-up and 112 patients completed 24 weeks of follow-up. The age, sex, BMI, FPG, PPG, serum cholesterol, serum triglycerides, serum HDL, and GHb of the subjects who withdrew at 12 and 24 weeks were similar in both groups at the baseline. Therefore, an intention-to-treat analysis was performed. A Student's *t* test was used to compare the mean values between the two groups. χ^2 test was applied to assess the association between the two groups and the other categorical variables. The STATA 6.0 intercooled version (STATA, Houston, Texas) was used to analyze data.

The treatment and control groups were comparable with regard to age, sex , blood pressure, body weight, BMI, serum creatinine, and urine albuminuria. However, despite randomization, the treatment group had worse symptoms, including significantly higher FPG and PPG values (178.2 ± 34.1 and 284.4 ± 65.3 mg/dl vs. 166.4 ± 35.5 and 260.2 ± 71.1 mg/dl, $P < 0.05$), as

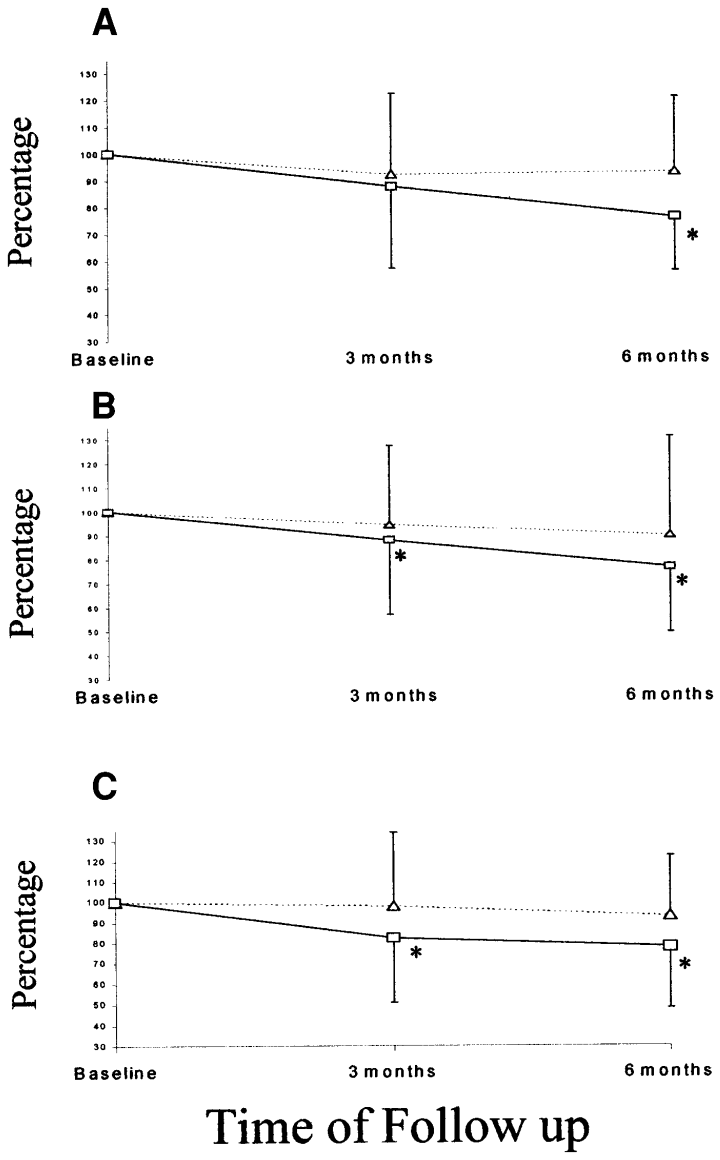

Figure 1—*Change in fasting plasma glucose (A), postprandial plasma glucose (B), and GHb (C), after treatment with Tibetan medicine. △, Control; □, treatment.* *P < *0.05.*

well as a higher GHb value (9.4 ± 3.0 vs. 8.5 ± 2.3%, $P < 0.01$), indicating poorer glycemic control at the start of the study in the treatment group. The treatment group also had a higher serum cholesterol level.

The percentage change in the levels of these parameters was calculated from the baseline of the treatment group, because the baseline plasma glucose values were different between the two groups (Fig. 1). Fasting blood glucose levels decreased by 12.2 ± 30.5% at 12 weeks and by 23.4 ± 20.0% at 24 weeks in the treatment group compared with 7.4 ± 30 and 6.4 ± 27.7% in the control group ($t = 0.94$, $P = 0.35$ at 12 weeks; $t = 3.76$, $P = 0.0003$ at 24 weeks). The PPG measurement was significantly lower in the treatment group at 12 and 24 weeks (decrease of 18.0 ± 31.2 and 23.4 ± 27.1%) compared with the control group (decrease of 5.5 ± 32.9 and 10.0 ± 41.2%) ($t = 2.21$, $P = 0.02$ at 12 weeks; $t = 1.98$, $P = 0.05$ at 24 weeks). At 12 weeks, the percentage decrease in the GHb levels was 1.9 ± 35.8% in the control group compared with 17.5 ± 31.3% in the treatment group ($t = 2.58$, $P = 0.011$). At 24 weeks, the decrease in GHb was 21.8 ± 30.1% in the treatment group compared with 6.7 ± 29.3% in the control group ($t = 2.44$, $P = 0.02$). There was no significant change in body weight, blood pressure, or serum lipids in either group.

Previous studies have reported that when used alone or in conjunction with sulfonylureas, traditional Chinese medicine decreases the fasting and postprandial blood glucose levels in diabetic patients (4,5). Chinese medicine has been reported to improve the symptoms of diabetes and insulin and glucose blood levels (5). However, there are no published reports in English medical literature regarding the effectiveness of Tibetan medicine in the treatment of diabetes. We report a significant improvement in glycemic control with the use of Tibetan medicine in patients with a recent onset of type 2 diabetes compared with patients treated only with diet and exercise. The improvement in glycemic control was observed at 3 and 6 months after the start of the treatment. We have not measured insulin or C-peptide levels in our patients.

One of the limitations of this study was a high drop-out rate during follow-up. However, the characteristics of the subjects who dropped out from the two groups were similar and therefore should not alter the conclusions. Further evaluation of the Tibetan medical system in patients with diabetes will require blinded placebo controlled trials and comparisons of this system with other available oral hypoglycemic agents.

TENZIN NAMDUL, BTMS
AJAY SOOD, DM
LAKSHMY RAMAKRISHNAN, PHD
RAVINDRA M. PANDEY, PHD
DENISH MOORTHY, MBBS

From the Department of Research and Development (T.N.), the Tibetan Medical and Astrological Institute (TMAI), Dharamsala, Himachal Pradesh; and the Departments of Endocrinology and Metabolism (A.S., D.M.), Cardiology (L.R.), and Biostatistics (R.M.P.), All India Institute of Medical Sciences, New Delhi, India.

Address correspondence to Dr. R.M. Pandey, Department of Biostatistics, All India Institute of Medical Sciences, Ansari Nagar, New Delhi 110029, India. E-mail: rmpandey@yahoo.com.

Acknowledgments — We would like to express our heartfelt gratitude to His Holiness the Dalai Lama for his immutable guidance and encouragement in initiating this project. We gratefully acknowledge the constant advice and pivotal role played by Dr. Tenzin Chodak and Dr. Lobsang Wangyal. We give our sincere thanks to Dr. Namgyal Qusar, Dr. Namgyal Tenzin, Mrs. Saroj, Ms. Indira, the Men-Tsee-Khang administration, the senior participating doctors (T. Tamdin, N. Tsering, S. Lhamo, D. Rabten, Y. Dorjee, T. Tsephel, T. Gyaltsen, P. Yangchen, P. Lhamo, T. Kyizom, T. Kyipa, and L. Chodhar), the junior participating doctors (K. Dorjee, T. Sangmo, D. Sangmo, S. Dolma, T. Lhamo, P. Dhondup, and T. Norbu), and last, but by no means the least, our grateful thanks to all of the patients for participating in the study.

References

1. Chotak T: Diabetes in Tibetan medicine. *sMan-rTsis Journal*. 1:1–10, 1995
2. Gompo YY, Ed.: Chenyi-nay-gSowa (To cure diabetes). In Man-Ngag-rGud (Third Tantra). Dharamsala, Men-Tsee-Khang (The Tibetan Medical and Astrological Institute), 1993, p. 329–331
3. American Diabetes Association: Nutrition recommendations and principles for people with diabetes mellitus (Position Statement). *Diabetes Care* 23 (Suppl. 1):S43–S46, 2000
4. Vray M, Attali JR: Randomized study of glibenclamide versus traditional Chinese treatment in type 2 diabetic patients. *Diabete Metab* 21:433–439, 1995
5. Meckes-Lozyoa M, Roman-Ramos R: Opuntia streptacantha: a coadjutor in the treatment of diabetes mellitus. *Am J Chin Med* 14:116–118, 1986

COMMENTS AND RESPONSES

Acknowledgments

In a recent article published in *Diabetes Care* (1), we forgot to thank Drs. Audi and Carrascosa for their technical assistance in the laboratory assessments. This note of appreciation should have been included in the ACKNOWLEDGMENTS. We apologize for this omission, as we believe it is only fair to recognize their important technical contribution.

RAFAEL SIMÓ, MD
ROSA BURGOS, PHD
CARLOS MATEO, PHD
ANA CANTON, PHD
CRISTINA HERNÁNDEZ, MD
JORGE MESA, MD

From the Diabetes Research Unit (R.S., R.B., A.C., C.H., J.M.) and the Ophthalmology Department (C.M.), Hospital General Universitari Vall d'Hebron, Barcelona, Spain.

References

1. Burgos R, Mateo C, Cantón A, Hernández C, Mesa J, Simó R: Vitreous levels of IGF-1, IGIF binding protein 1, and IGF binding protein 3 in proliferative diabetic retinopathy: a case-control study. *Diabetes Care* 23:80–83, 2000

Therapeutic Benefits of ACE Inhibitors and Other Antihypertensive Drugs in Patients With Type 2 Diabetes

Recently, Pahor et al. (1) presented a meta-analysis based on four studies assessing whether ACE inhibitors are superior to alternative agents for the prevention of cardiovascular events in patients with hypertension and type 2 diabetes. The four eligible trials were as follows: *1*) the Fosinopril Versus Amlodipine Cardiovascular Events Randomized Trial (FACET), *2*) the Appropriate Blood Pressure Control in Diabetes Trial (ABCD), *3*) the Captopril