OBSERVATIONS

Measurement of the Walking Duration With Therapeutic Shoes in Neuropathic Diabetic Patients by a Novel Device (Show-me)

Therapeutic shoes and other prophylactic interventions are used to prevent diabetic foot ulceration (1,2), but patient's compliance to use prescribed footwear has never been investigated in primary care. Therapeutic footwear might be effective in secondary ulcer prevention, as demonstrated in two noncontrolled trials, but was only effective when worn >60% of the daytime (3) or >8 h a day (4). In a controlled clinical trial, no benefit was observed between control patients wearing their own footwear and intervention patients wearing specialized footwear (5).

The aim was to measure the duration of walking with therapeutic shoes by a novel device, "Show-me" (shoe-wearing measuring equipment), in neuropathic patients without a history of ulcers.

Twenty-eight diabetic patients with an active lifestyle without major restrictions in bodily fitness were enrolled into the study. Patients gave their written informed consent and were aware of Show-me, which was built into the heel of the shoe. They were instructed to regularly wear their protective in-depth shoes outdoors (two different models of Medi shoe for women and men were offered, made by Bata, Cz). Neuropathy was defined by an abnormal vibration perception threshold at the tip of the great toes (6).

Show-me is a force-sensor–based measuring device comparing a reference voltage with the signal from the sensor. By adjustment, an external load ≥400 N indicates walking, and discretization time for successive walking periods was set to 1 min. To elongate battery capacity, the electronic components, except the quartz-controlled timer, returned to sleep mode during periods between single walks. The measurement error was calculated with less than ±3.5% for a duration of walking of 30 min.

Twenty-five (89.3%) subjects suffered from type 2 diabetes, and 21 (75.0%) were male. Their mean age was 63.1 ± 6.2 years (95% CI 60.7–65.5), the mean duration of diabetes was 19.8 ± 10.4 years (15.8–23.9), and the mean vibration perception threshold was 39.7 ± 9.6 volts (36.0–43.5).

Fifteen patients started wearing the shoes during the warm season and 13 during the cold season. The mean study duration was 84.1 ± 34.3 days (70.8–97.4). Medi shoes were used for walking a total period of 3,156 h by all subjects, which corresponded to a median duration of walking of 81.8 h (lower quartile 41.5, upper quartile 107.0) per patient. The median daily duration of walking was 0.95 h (0.56, 1.19), but a great variation of the daily duration of walking was observed; the lowest daily median duration of walking was 0.28 h and the highest 6.84 h. Men used their Medi shoe significantly ($P = 0.009$, Mann-Whitney test) longer for daily walking than women (1.0 [0.8, 1.6] vs. 0.6 [0.3, 0.7]). Five of 28 (18%) subjects, all male, walked with their Medi shoes for longer than 1.5 h a day. The duration of walking was not significantly correlated to age, diabetes duration, or nerve function.

We have demonstrated a short daily duration of walking with therapeutic shoes in patients at risk for foot ulceration and would suggest to measure duration of walking as one key parameter in future trials on benefits of therapeutic footwear in diabetic patients.

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DOI: 10.2337/dc06-0396

Acknowledgments— This study was sponsored by the "Initiative for Biomedical Technology" (BMVIT, FFF, and ÖGBMT) grant no. 805336 together with H. Ochensberger (Orthopädie Schuhtechnik, Vienna), who was also involved in preparing shoes for the placement of Show-me.

Intermediate results were presented at the Annual Meeting of the Austrian Diabetes Association 2003.

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Prevalence of Metabolic Syndrome in Rural Bangladeshi Women

The National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III) (1) defined metabolic syndrome as a presence of any three of the following (in women): *1*) waist circumference >88 cm, *2*) high triglycerides (≥150 mg/dl), *3*) low HDL cholesterol (<50 mg/dl), *4*) high blood pressure (≥130/85 mmHg or use of antihypertensive therapy), and *5*) high fasting blood glucose (≥110 mg/dl). This clustering of risk factors in metabolic syndrome ultimately leads to diabetes and premature cardiovascular disease (2). It is imperative to identify individuals with metabolic syndrome early so that lifestyle interventions and treatment may prevent the

development of diabetes and/or cardiovascular diseases. The aim of this study was to determine the prevalence of metabolic syndrome in a rural sample of women because such data are not available.

This study was done in 2001 in Ekhlaspur, a village of Chandpur district. There were 1,350 women aged ≥18 years in Ekhlaspur. We randomly invited 375 women, and 314 (84%) of them responded. All participants gave informed consent. Blood pressure was measured twice on the right arm while in the seated position, at least 2 min apart, with the average being used for analysis. Waist circumference was measured midway between the iliac crest and costal margins after removing folds of clothing. Plasma triglycerides and glucose were measured on fasting venous blood samples by using an autoanalyzer.

The average age of our subjects was 39 ± 15 years (mean ± SD), with a median schooling of 4 years. As per the NCEP ATP III (1) definition, the prevalence of metabolic syndrome varied depending on combinations: 1.3% for abdominal obesity plus high levels of plasma glucose and triglycerides, 1.6% for abdominal obesity plus high levels of blood pressure and plasma glucose, and 2.9% for abdominal obesity plus high levels of blood pressure and plasma triglycerides. These prevalences were largely age dependent. Women aged ≥45 years had a prevalence of metabolic syndrome that was three to six times higher than their younger counterparts. This may be due to menopause and low level of physical activity in the elderly women.

The present study describes population prevalence of metabolic syndrome in Bangladesh for the first time. The prevalence observed is relatively low (<3%). This is contrary to that suggested by studies on Bangladeshi immigrants to the U.K. (3). The low prevalence occurred despite the fact that a large proportion (65%) of women had low HDL cholesterol level. This may indicate a low tendency for the clustering of traits. Higher prevalence of insulin resistance in immigrants may be due to unfavorable environmental triggers such as stress, physical inactivity, and smoking (3).

Physical activity level in this agricultural population is high because of their traditional lifestyle. Regular physical activity reduces obesity, increases HDL cholesterol, and decreases triglycerides (1). Smoking may lead to insulin resistance and abdominal obesity (4). It is also well known that smoking elevates triglycerides and lowers HDL cholesterol. Smoking is almost absent (0.3%) in our sample. The combined effect of good physical activity level and a very low prevalence of smoking may partly explain the observed low prevalence of metabolic syndrome in this rural population of Bangladesh. Studies in urban populations are necessary.

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DOI: 10.2337/dc06-0431

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Feeding Attitudes of Pregnant Women With Diabetes

The importance of breast milk in early childhood health and development is well known (1). While feeding decisions are known to be strongly influenced by socioeconomic, ethnical, and cultural characteristics (2,3), the impact of chronic illness on feeding attitudes has not been extensively studied. We proposed to compare feeding choices made by pregnant women with and without preexisting type 1 diabetes.

We surveyed pregnant women, with and without diabetes, regarding their feeding decisions in six diverse practices in Nashville, Tennessee, representing a broad range of socioeconomic, racial, and practice characteristics. The study underwent review by the institutional review board.

Women were interviewed utilizing the Iowa Infant Feeding Attitude Survey (IIFAS), a validated instrument containing 17 questions assessing positive and negative attitudes toward breast-feeding, which has been shown to correlate with ultimate feeding decisions (4). After excluding 20 women with gestational diabetes, the final sample included 144 women, including 55 women with insulin-requiring diabetes (51 type 1 and 4 type 2 diabetes) and 89 women without diabetes.

The mean age of mothers was 28.4 years (range 15–42); 27% of the sample was African American, and just over one-third was enrolled in Medicaid. Two-thirds of the mothers (65%) planned to return to work after delivery. The mean IIFAS score for the entire sample was 59.9. IIFAS scores did not differ by age, race, maternal education, or marital status. Women who did not plan to return to work had higher mean IIFAS scores than women who planned to return to work (62.3 ± 7.4 vs. 58.8 ± 9.1; $P = 0.05$). There was no difference in the mean IIFAS score for diabetic versus nondiabetic women ($P = 0.54$) and no difference in the proportion of women with diabetes who planned to breast-feed (56 vs. 62%; $P = 0.56$).

While women with diabetes felt that diabetes prevented them from doing things other mothers do during pregnancy (39% endorsed this statement vs. 3% of nondiabetic mothers), the two groups did not differ in their attitudes toward problems with breast-feeding for women taking medications or whether women with diabetes should feed their infants with formula.

Our results showed that having preexisting type 1 diabetes did not influence maternal decision making, as indicated by the IIFAS score and stated intention to feed. The findings of this study have implications for providers caring for women of child-bearing age with type 1 diabetes,