

## Clanging Tuning-Fork Test Zeros In on Nondiabetic Neuropathy

BY JOYCE FRIEDEN

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CHICAGO — Results of a tuning-fork test to identify neuropathy appear to be reproducible in a nondiabetic population, according to findings from a blinded, observational study.

In a presentation at the annual meeting of the American Association of Clinical Endocrinologists, Dr. David S. Oyer of Northwestern University, Chicago, Ill., described how he and an associate used a tuning-fork test to evaluate 147 patients aged 40 years and older. All patients had a history of sciatica, cerebrovascular accident, or chemotherapy.

For the test, a C128 tuning fork was struck to make the ends clang together, and then patients were shown the difference between the vibration sensation and pressure on the patient's toe, malleolus, knee, or sternum. The tuning-fork test was performed again at the end of the dorsal bony prominence of the patient's big toe proximal to the nail. Blinded, the patients then indicated when they could no longer feel the vibration.

Vibration sensation duration was measured in both feet. Patients repeated the test, and the average number of seconds was taken to represent final scores, which were then analyzed for correlations between the right versus left foot, statin versus nonstatin use, and overall difference in sensation by age-group decade. Overall, 80% of patients were within 2 seconds between the right and left feet, suggesting the test's consistency.

The average score for all patients was  $12.8 \pm 4.7$  seconds. Average scores were 14.3 seconds for patients aged 40-49, 14.1 seconds for patients aged 50-59, 12.2 seconds for patients aged 60-69, 9.4 seconds for patients aged 70-79, and 4.8 seconds for patients aged 80-89. There was an average 1.43-sec-

ond longer vibration sensation in patients not on statins, the researchers noted.

The investigators determined that normal score cutoff values were above 7.5 seconds in those aged 40-49, 6.9 seconds in the 50-59 age group, and 3.8 seconds in the 60-69 age group. Cutoff values could not be determined for those patients older than 70.

Patients' sex, alcohol use, height, NSAID use, smoking history, and other unknown factors may explain the variability in the test results, the researchers suggested. Larger studies may help reduce the degree of variability by age group.

The findings dovetail with those from a previous investigation in which Dr. Oyer found that the tuning-fork test was far more effective than the more widely used monofilament test in detecting distal polyneuropathy. That study involved 45 diabetes patients who had vibration test scores of 0-8 seconds, indicating some level of neuropathy. Of those 45 patients, only 16 had abnormal monofilament test results (*Endocr. Pract.* 2004;10[Suppl. 1]:20).

"The clanging tuning-fork test detects neuropathy at a much earlier stage than the monofilament test," Dr. Oyer said in an interview. ■



Dr. David S. Oyer holds a fork on the toe with two fingers on the stem, timing until the patient cannot feel the vibration.

COURTESY DR. DAVID S. OYER

## PM Hypertension Flags Type 1 Complications

BY SARAH PRESSMAN  
LOVINGER

Contributing Writer

CHICAGO — With the goal of preventing renal complications in type 1 diabetics, nephrologists have begun to focus on subtle increases in nighttime blood pressure as a risk factor for the subsequent development of overt nephropathy.

"It is a concept we are pioneering, a very promising approach," Dr. Daniel Batlle said at a meeting on clinical nephrology sponsored by the National Kidney Foundation.

In a prospective study, he and his associates followed 75 young type 1 diabetics without microalbuminuria at baseline for 5 years. After 2 years, none of the subjects had developed any urinary protein, but 18% of the subjects went on to develop microalbuminuria. In those who developed microalbuminuria, the mean systolic pressure during sleep increased significantly (from 109.9 to 114.9 mm Hg). This group had elevated systolic blood pressure only at night (*Kidney Int.* 2003;63:2319-30).

This line of research is a departure from the classic reasoning that blood pressure does not start to increase until overt proteinuria occurs in diabetics, noted Dr. Batlle, chairman of the nephrology department at Northwestern University, Chicago.

No specific treatments for

mild nocturnal hypertension have been developed, but a 5-year National Institutes of Health study of 300-400 patients should shed more light on the importance of nocturnal hypertension in diabetics, said Dr. Batlle, the study's principal investigator. "Systolic [hypertension] seems to be a more powerful predictor that diastolic," he added.

Nephrologists have long considered microalbuminuria to be the best marker for predicting progression of renal disease, but more recent studies have shown that the cumulative incidence of overt nephropathy in patients with type 1 diabetes and microalbuminuria is only about 25%. "So obviously, microalbuminuria is not as good a predictor as we thought," he explained.

In addition to microalbuminuria, researchers also have considered histology and genetics in the search for a marker for an increased risk of nephropathy. Renal biopsies of 170 type 1 diabetics with albuminuria that regressed in some patients but progressed in others revealed that a wider glomerular basement membrane could lead to the development of proteinuria (*Diabetes* 2005;54:2164-71).

Researchers have not yet shed light on the genetic nature of proteinuria. "We don't have a good genetic marker," Dr. Batlle said. A family history of nephropathy confers the greatest risk of microalbuminuria. ■

## Type 2 Diabetes' Effects on Pregnancy Underestimated

HOLLYWOOD, FLA. — Women need to be better educated about the risks of type 2 diabetes in pregnancy, Dr. Erin Keely said at the annual meeting of the Society for Obstetric Anesthesia and Perinatology.

"Type 2 diabetes is at least as dangerous in pregnancy as type 1 diabetes," said Dr. Keely of the University of Ottawa.

The incidence of type 2 diabetes is on the rise—largely due to the increasing prevalence of obesity. Since 1991, there has been more than a 60% increase in the prevalence of obesity.

About 6% of women of childbearing age are morbidly obese (body mass index over 40), and obesity is associated with substantially increased risk of gestational diabetes and type 2 diabetes. In fact, 90% of

women with type 2 diabetes are overweight, she noted.

The problem of increasing type 2 diabetes in pregnancy is compounded by the fact that the age of onset of type 2 diabetes is decreasing, and maternal age is increasing, she said.

Research suggests type 2 diabetes is linked to double the risk of stillbirth, 2.5 times the risk of perinatal mortality, and 11 times the risk of congenital anomalies. Hypertension, anesthesia-related mortality, and preeclampsia are also increased.

Maternal diabetes also seems to have long-term effects for offspring, who have a dramatically increased risk of diabetes and other problems throughout life.

—Sharon Worcester

## Gender Disparities Dog Type 2 Care; Women's CVD Risks Undertreated

BY JANE NEFF ROLLINS  
Contributing Writer

LOS ANGELES — Women with type 2 diabetes may be treated for dyslipidemia less aggressively than men, and therefore may be at higher risk of developing cardiovascular disease, Dr. Quyen Ngo-Metzger reported at the annual meeting of the Society of General Internal Medicine.

Coronary heart disease (CHD) is a leading cause of death among women and among all patients with type 2 diabetes. Diabetes confers a four times greater risk of CHD in women, compared with a doubling of risk in men, said Dr. Ngo-Metzger, of the University of California, Irvine.

She and her associates examined quality of care in a sample

of 4,879 men and 7,654 women with type 2 diabetes (mean age 56 years) who were treated at 16 Kaiser Permanente Georgia practices in 2002. About two-thirds of men and women received recommended hemoglobin A<sub>1c</sub> and cholesterol testing. About one-quarter of men (25%) and women (27%) achieved glycemic control (a hemoglobin A<sub>1c</sub> value of less than 7%).

Overall, 72% of men and 68% of women achieved LDL-cholesterol levels of less than 130 mg/dL, a statistically significant difference. After adjustment for age and comorbid conditions in multivariate analyses, men were 26% more likely than women to have an LDL-cholesterol value of less than 130 mg/dL.

Among high-risk patients with

known CHD, 86% of men and 76% of women had an LDL-cholesterol level of less than 130 mg/dL; after adjustment for age and comorbidity, men were twice as likely as women to have lipid control at this cutoff. In addition, 56% of men and 44% of women had an LDL-cholesterol level of less than 100 mg/dL; after adjustment, men were 64% more likely than women to have achieved control using this more stringent definition.

Forty-three percent of men were prescribed statins, versus 37% of women; this difference was statistically significant. Future research is needed, she noted, to determine whether the differences reflect providers' prescribing habits or personal preferences among women and men. ■