Metabolic Syndrome Fails to Predict CVD Risk

BY LORINDA BULLOCK
Associate Editor

Metabolic syndrome is associated with type 2 diabetes but not cardiovascular disease in elderly patients, according to study findings.

Criteria for metabolic syndrome were developed to help improve understanding of the links between insulin resistance and vascular disease, wrote Dr. Naveed Sattar of the University of Glasgow (Scotland) and colleagues.

Nevertheless, the clinical role of these criteria, which were "designed to predict people at risk of events of cardiovascular disease (CVD) or diabetes, remains contentious," they noted. Few studies have been able to simultaneously link metabolic syndrome to risk for both diabetes and coronary heart disease, and "to establish whether prediction of both end points can be usefully achieved by one set of criteria," the investigators wrote.

Dr. Sattar and his associates analyzed data from their Prospective Study of Pravastatin in the Elderly at Risk (PROSPER) and corroborated the data in another prospective study, the British Regional Heart Study (BRHS). The PROSPER study comprised 4,812 nondiabetic men and women aged 70-82 years who had either preexisiting vascular disease or raised risk of such disease. The BRHS study comprised 2,737 nondiabetic men aged 60-79 years (Lancet 2008 May 22 [doi:10.1016/S0140-6736(08)60602-9]).

In both studies, Dr. Sattar and his associates were able to establish five components of the metabolic syndrome: body mass index or waist circumference, triglyceride levels, glucose cutoff points, HDL cholesterol level, and blood pressure. In both studies, all five components were associated with risk of new onset diabetes, but "cutoff points for fasting glucose, triglyceride, and waist circumference had no association with risk of incident coronary heart disease in either study despite strong associations with incident diabetes," they wrote.

In the PROSPER study, there were 772 cases of incident CVD and 287 cases of incident diabetes diagnosed over a 3.2-year period. Metabolic syndrome was not associated with an increased risk of CVD in those without CVD at baseline (hazard ratio 1.07), but was associated with a more than fourfold increased risk of diabetes (HR 4.41).

The BRHS study had similar results—even with patients who had preexisting cardiovascular disease. A total of 440 cases of CVD and 105 cases of diabetes occurred during the follow-up of 7 years. In this study, metabolic syndrome was associated with only a small increased risk of CVD (HR 1.27), but a more than sevenfold increased risk of diabetes (HR 7.47).

"Results from this study show that metabolic syndrome has negligible clinical association with incident vascular events in elderly people despite strong associations with risk for incident type 2 diabetes in two prospective studies," Dr. Sattar and his colleagues wrote.

"Our clear finding in both studies of substantial differing diabetes versus cardiovascular disease associations of metabolic syndrome and its components should aid better general understanding of differing risk patterns for these two diseases, which therefore should not be considered together. Our findings should help other investigators to think about their data in a similar critical way."

The investigators declared no potential conflicts of interest. The metabolic syndrome analysis for PROSPER was funded by a Diabetes UK project grant. ■

Simple Steps Can Help Avert Foot Ulcers in Diabetic Patients

BY MIRIAM E. TUCKER
Senior Writer

WASHINGTON — The use of therapeutic shoes and the home monitoring of foot-skin temperature by diabetic patients who are at high risk for foot ulceration are two simple, low-tech preventive measures that could greatly reduce costs and improve patient outcomes if adopted more widely, according to Lawrence A. Lavery, D.P.M.

A foot ulcer is one of the most common precursors to the more than 100,000 diabetes-related amputations performed in the United States every year. Yet simple measures that can reduce the rate of foot ulceration are not being done, he said at the annual meeting of the American Association of Diabetes Educators.

"Prevention is a low-tech process," said Dr. Lavery of the department of surgery at Texas A&M University, Temple.

Prevention efforts should focus on patients who are at greatest risk. In a study of 1,666 diabetic patients, Dr. Lavery and his associates stratified the risk classification beyond the current system that was established by an international working group (Diabetes Care 2001;24:1442-7).

Over a mean follow-up of 27 months, the risk of ulceration for patients with no peripheral neuropathy or peripheral vascular disease (PVD) was 2%, whereas those with neuropathy alone had a 4.5% risk and those with neuropathy plus a foot deformity had a 3.0% ulceration risk. High rates of ulceration occurred in patients with a history of PVD (14% risk) and in those with a previous ulcer or a history of amputation (14% risk) (Diabetes Care 2008;31:154-6).

Hospitalization rates, which were 1% for patients with neuropathy alone and 2% for those with a deformity, jumped to 16% for patients with PVD, 8% for those with a history of ulceration, and 50% for those with a previous amputation. Amputation rates were relatively low: from 0% in those with no disease or neuropathy alone to 0.7%-2.2% among those with deformity, PVD, and ulcer history. But the risk for a second amputation was 50% among those who already had one.

"Just 20% of the patients account for 70% of the ulcers and 90% of the amputations and hospitalizations. This tells us where to focus our educational efforts appropriately," said Dr. Lavery, coauthor of a new task force report on foot assessment from the American Diabetes Association.

For patients at risk, elimination of the shoe as a source of pathology is a simple yet underutilized measure. About 20% of foot ulcers are triggered by ill-fitting shoes, mostly among women. "The easiest thing to do is just look at their shoes," Dr. Lavery noted.

Since 1995, Medicare has covered therapeutic footwear and insoles for patients who are at risk for ulceration, but fewer than 3% of eligible patients receive the benefit. This is presumably because of a lack of awareness among providers as well as the cumbersome paperwork involved. "This is a simple, low-tech, very effective intervention that we don't do," he said.

Even when physicians are diligent about checking the feet and shoes of their patients, the transformation from injury to ulceration occurs far too rapidly to be left to examinations at 3-month intervals. That's why it's essential for patients to check their feet at home on a daily basis.

But about 54% of patients can't see the bottoms of their feet, because of impaired vision, obesity, limited joint mobility, or a combination of those factors (Arch. Intern. Med. 1998;158:157-62).

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Heat is an easy risk factor to identify, said Dr. Lavery, shown taking the temperature of a patient's Lawrence A. foot.

"About half of patients whom we're asking to inspect their feet haven't been able to see their feet in the last several years," Dr. Lavery remarked.

Moreover, the cardinal signs of inflammation that precedes ulceration—including pain, loss of function, edema, redness, and heat—can go unnoticed, particularly among patients who have neuropathy. Indeed, "even trained health care professionals probably cannot identify subtle precursors to ulceration," he said.

Of the five factors, heat may be the easiest to identify. In three published studies, a long-armed handheld infrared skin thermometer called TempTouch (www.temptouch.com), manufactured by a San Antonio-based company called Diabetica Solutions Inc., reduced the risk of foot complications among high-risk diabetic patients. Dr. Lavery, who owns stock in the company and serves on its advisory board, was the lead author on two of the three studies and a coauthor on the third.

In the initial pilot study, 85 patients with neuropathy and foot deformity, or with previous history of ulceration or partial foot amputation, were randomized to standard therapy—including therapeutic footwear, diabetic foot education, and regular foot evaluation by a podiatrist—or to "enhanced" therapy, which included the standard measures plus twice-daily use of the dermal thermometer device at six sites on each foot. Patients were instructed to contact a study nurse and to minimize walking if they detected a temperature difference of more than 4° F. in the corresponding sites of the two feet.

At 6 months, there were nine foot complications, including seven ulcers and two Charcot's fractures, among the 44 patients in the standard therapy group (20%), compared with just one ulcer (2%) in the 41 patients who used the thermometer, Dr. Lavery and his associates reported (Diabetes Care 2004;27:2642-7).

In a second study of 225 similarly high-risk patients that used the same methods, patients in the dermal thermometry group were one-third as likely to ulcerate at 18 months as were those in the standard therapy group (12% vs. 5%), and the thermometry was associated with a longer time to ulceration (Am. J. Med. 2007;120:1042-6).

In the third study, 173 high-risk patients with a history of foot wound and sensory neuropathy with a loss of protective sensation were randomized to one of three groups. Standard therapy consisted of lower-extremity evaluation by a physician every 8 weeks; education focusing on foot complications and self-care practices; therapeutic insoles and footwear; and advice to the patients to inspect their feet every day and to contact the study nurse if they identified any areas of concern (Diabetes Care 2007;30:14-20).

A second group had the standard therapy plus a structured foot exam, in which they were trained to use a mirror twice a day to inspect the bottom of their feet for redness, discoloration, swelling, and warmth by palpation and to log the results. Patients in a third group received standard therapy and were instructed to use the digital infrared thermometer twice daily and to record the temperatures.

At 15 months, the ulceration rate was essentially identical in the standard and structured foot exam groups (29% and 30%, respectively). In contrast, only 8.5% of the group that used the thermometer developed a foot ulcer, a fourfold reduction in risk. ■