

Probe to Bone Not as Useful in Clinical Setting

Compared to results in a population of hospitalized patients, investigators reported that positive probes for osteomyelitis were not as prevalent in clinical practices.

BY LAURA SUAREZ, ASSOCIATE EDITOR

Probe to bone (PTB) is currently considered the gold standard to diagnose the neuropathic complication of osteomyelitis in patients, including those with diabetes. However, indication of its value as a diagnosis tool for osteomyelitis is limited to hospital settings.

Lawrence A. Lavery, DPM, MPH, and colleagues initiated a prospective longitudinal clinical trial that studied bone infections in the presence of diabetic foot ulcers. Dr. Lavery and colleagues also assessed PTB's accuracy as

Still considered the gold standard, probe to bone may not be a strong enough indicator of osteomyelitis to use in the clinical setting.

an osteomyelitis tool in the same setting. He presented their findings at the American Diabetes Association 65th Annual Meeting and Scientific Sessions in San Diego,

TABLE 1. STUDY POPULATION DEMOGRAPHICS AND BACKGROUND

Demographics	
Medicare age/ ≥ 65 years	75%
Sex	
Male	50.3%
Female	49.7%
Duration of diabetes	11 years
Body mass index >30	42%
Ethnicity	
Non-Hispanic	44%
Mexican American	52%
African-American	4%
Complications	
Protective sensation/Sensory neuropathy	40%
Peripheral vascular disease	12%
Structural foot deformities/limited joint mobility	63%

where he said that PTB testing in the clinical setting may not be a strong enough indicator of osteomyelitis.

Previous studies testing the accuracy of PTB indicated that it positively predicts osteomyelitis 89% of the time, Dr. Lavery said. However, because patients were enrolled from a hospital setting, they were more likely to have osteomyelitis or a severe infection. In a clinical physician setting, results with the PTB were not as accurate as in hospital settings, as it only had a positive predictive value 57% of the time.

Dr. Lavery said that PTBs may more accurately be used to rule out the presence of osteomyelitis in the clinical setting, as it had a 98% negative predictive value.

INDEX OF SUSPICION

“The role of evaluating [PTBs] is to give us some clues when we see people that raise our clinical index of suspicion,” he said. “We need to look harder at these people. Their risk of having a bone infection may be higher [than was predicted by the PTB test].”

Dr. Lavery and colleagues developed a diabetes management cohort in which patients from several large physician groups in San Antonio received lower limb complications care from the investigators instead of their usual physician.

“We basically eliminated the referral barrier [during the study] for patients to see us or for us to refer them to other specialists like vascular labs or vascular surgeons as part of this program,” Dr. Lavery said during the presentation.

SENSORY NEUROPATHY

Patients were followed for an average of 27.2 months. They received an examination that included sensory neuropathy testing, peripheral vascular disease testing, foot pressure testing and joint mobility function. Sensory neuropathy was defined as “inability to feel >1 sites

with the Semmes Weinstein monofilament or inability to feel >25 volts with the biothesiometer or when measuring the vibration detection threshold,” Dr. Lavery said.

Approximately 40% of the 247 patients with a lower extremity wound had sensory neuropathy or loss of protective sensation. Twelve percent had peripheral vascular disease and 63% had limited joint mobility (Table 1).

Patients had diabetes for an average of 11 years, and were either non-Hispanic, Mexican American or African American. Forty-two percent of patients had a body mass index >30.

As determined with a positive bone culture, approximately 20% of wounds went on to infection involving the bone.

Identification of the wound as penetrating the bone tendon, capsule or through the dermicin determined the depth of the wound. Wound infections were found in 151 of the patients, and 186 infections were presented during patient analysis. Approximately 20% of wounds went on to infection involving the bone. This was determined with a positive bone culture, which is an international foot infection diagnosis guideline, according to Dr. Lavery.

MOST LIKELY TO DEVELOP OSTEOMYELITIS

Those patients who had the deepest wounds were the most likely to have osteomyelitis. The odds ratio in this group was 8.7, Dr. Lavery said. Other indications of osteomyelitis were ulcers on the toes, previous amputation, peripheral vascular disease and subsequent wounds or ulceration (Table 2).

“If you are looking at a patient population that is hospitalized for severe infections, you can probably expect that your [PTB] is going to be synonymous with osteomyelitis,” Dr. Lavery said.

However, if patients are being evaluated in a clinical setting, it is not as easy to rely on PTB to determine osteomyelitis. If the probe results are negative, it is safe to rule out osteomyelitis. ■

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Lavery LA. Risk Factors for Developing Osteomyelitis of the Foot in Persons with Diabetes: A Prospective Study. Presented at the ADA 65th Annual Meetings and Scientific Sessions. June 10-14, 2005. San Diego.

TABLE 2. RISK FACTORS FOR DEVELOPING OSTEOMYELITIS WITH THE STRONGEST ODDS RATIOS
1. Depth to bone
2. Ulcers located on the toe
3. History of previous amputation
4. Patients with peripheral vascular disease
5. Patients with recurring ulcers
6. Patients who developed another ulcer/wound during the study