

Type 2 Diabetes: Preventing Complications

Cardiovascular Autonomic Neuropathy

Stopping Silent Heart Attacks

Cardiovascular autonomic neuropathy (CAN), or nerve damage to the cardiovascular system, begins silently without symptoms of chest pain or discomfort (angina), and often remain undetected until serious myocardial infarction (death of the heart muscle due to lack of oxygen) has occurred. Consequently, these "silent heart attacks" often pass without the individual seeking any medical attention. Once symptoms do appear, the mortality rate is up to 50% within five years. This is why early diagnosis is so important.

Symptoms that may signal a silent heart attack include:

- Unexplained shortness of breath.
- Weakness and fatigue.
- Unexplained excessive perspiration.

Orthostatic hypotension

CAN sufferers may also have a sudden drop in blood pressure known as orthostatic, or postural, hypotension. They experience a sudden lightheadedness, dizziness, visual disturbance, and potential loss of consciousness when they stand up or when they sit up quickly after laying down. This is because blood vessel and nerve damage prevent their blood pressure from rising quickly enough to compensate for the change in position.

Making the diagnosis

Patients with CAN have little variation in their heart rate, which typically remains continuously elevated both at rest and under stress (e.g., after exercise). It is this defining feature that enables physicians to diagnose CAN with a simple, non-invasive test known as heart rate variability (HRV) testing.

In HRV testing, patients are hooked up to an electrocardiograph and their heart rate is measured while they perform three different tasks:

- Deep breathing.** Measures heart and respiration rate during paced deep breathing.
- Valsalva's maneuver.** The patient forcefully exhales through the mouth, with the nose closed. In healthy patients, this slows the heart rate.
- Postural test.** Heart rate is measured while laying down, rising to a standing position, and while standing.

After the test, which takes approximately 10 to 15 minutes, ECG tracings are analyzed and autonomic neuropathy is diagnosed if heart rate does not respond appropriately to these three tasks (i.e., if it remains consistent despite changes in breathing patterns and body position). Both the American Heart Association and the American Association of Clinical Endocrinologists recommend heart rate variability testing for the detection of diabetic autonomic neuropathy.

In addition to heart rate variability testing, the American Diabetes Association recommends that people with diabetes at risk for coronary artery disease (CAD) undergo thallium scintigraphy and an exercise stress test. This includes people over age 35 with type 1 and type 2 diabetes, and those diagnosed with type 1 diabetes for over 15 years.

Treatment options for diagnosed CAN include:

- Smoking cessation.

- Drugs that increase blood volume (to treat orthostatic hypotension).

- Alpha-lipoic acid.*

If you have questions about heart rate variability testing and treatment options for CAN, talk to your doctor.

*Therapies that are still considered investigational or in trials, but have shown some promise in clinical research studies.

Last Modified Date: March 27, 2006

Page: [1](#) | 2

