

Insulin Resistance May Flag Ischemic Stroke Risk

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FROM THE ARCHIVES OF NEUROLOGY

Insulin resistance appears to be associated with a nearly threefold increased risk for ischemic stroke, independently of established cardiovascular risk factors such as diabetes, obesity, and the metabolic syndrome, according to a prospective cohort study.

If this conclusion is confirmed in fur-

ther studies, “insulin resistance may [become] a novel therapeutic target for stroke prevention,” said Dr. Tatjana Rundek of the neurology department at the University of Miami and her associates.

The investigators used data from the Northern Manhattan Study, a prospective, population-based cohort study of stroke, to examine the issue. The study population comprised 1,509 older adults residing in a multiethnic urban com-

munity who were enrolled between 1993 and 2001 and followed for a mean of 8.5 years.

The study subjects had no stroke, MI, or diabetes at baseline. The mean age was 68 years. About 60% were Hispanic, 20% were black, and 20% were white. In all, 23% of the men and 26% of the women were estimated to have insulin resistance, as measured indirectly by the homeostasis model assessment (HOMA).

Overall, 180 subjects had one or more symptomatic vascular events, including 46 ischemic strokes, 45 MIs, and 121 vascular deaths.

Study subjects with insulin resistance – those in the highest quartile of HOMA scores – showed a significant 2.8-fold higher risk of ischemic stroke than those with lower HOMA scores. This association was stronger in men than in women, and it persisted when the data were adjusted to control for sociodemographic factors, the presence or absence of the metabolic syndrome, and vascular risk factors.

In contrast, neither the association between insulin resistance and MI nor the association between insulin resistance and vascular death were significant, Dr. Rundek and her colleagues said (*Arch. Neurol.* 2010;67:1195-200).

The findings should not be considered conclusive, since replication “with larger data sets and more end points” is still necessary, they added.

Support for the study included the Goddess Fund for Stroke Research in Women, the National Institute of Neurological Disorders and Stroke, the American Heart Association, and Columbia University. No financial conflicts of interest were reported. ■

Indications for Use

The CGMS *iPro* Digital Recorder is intended to continuously record interstitial glucose levels in persons with diabetes mellitus. This information is intended to supplement, not replace, blood glucose information obtained using standard home glucose monitoring devices. The information collected by the digital recorder may be downloaded and displayed on a computer and reviewed by healthcare professionals.

This information may allow identification of patterns of glucose-level excursions above or below the desired range, facilitating therapy adjustments which may minimize these excursions.

The CGMS *iPro* Digital Recorder:

- Is intended for prescription use only.
- Will not allow readings to be made available directly to patients in real time.
- Provides readings that will be available for review by physicians after the recording interval (72 hours).
- Is currently intended for occasional rather than everyday use.
- Is to be used only as a supplement to, and not a replacement for, standard invasive measurement.
- Is not intended to change patient management based on the numbers generated, but to guide future management of the patient based on response to trends noticed. That is, these trends or patterns may be used to suggest when to take fingerstick glucose measurements to better manage the patient.

The glucose sensor, tester, charger, and CGMS *iProWand* are intended for use with the CGMS *iPro* Digital Recorder. The Sen-serter® device is indicated only for insertion of the Medtronic MiniMed glucose sensor.

Important Safety Information

Contraindication

Do not use magnetic mattress pads while wearing the CGMS *iPro* Digital Recorder.

Warning

Product contains small parts and may pose a choking hazard for young children.

Important Safety Information, continued

Sensor

The glucose sensor should be removed if redness, bleeding, pain, tenderness, irritation, or inflammation develops at insertion site, or if you experience unexplained fever. An optional occlusive dressing should be removed if irritation or reaction to the tape develops.

The glucose sensor may create special needs regarding your patients' medical conditions or medications. Healthcare professionals should discuss this with their patients before they use the glucose sensor.

Wait 5 minutes after glucose sensor insertion before setting up the CGMS *iPro* Digital Recorder with Solutions CGMS *iPro*.

- Make sure that the site is not bleeding before connection.
- If bleeding occurs, apply steady pressure with a sterile gauze or clean cloth at the insertion site until bleeding stops. After bleeding stops, attach the digital recorder to the glucose sensor.
- If bleeding persists after 3 minutes, remove the glucose sensor and discard. Insert a new glucose sensor in a different location.

Contact the 24 Hour HelpLine if you experience any adverse reactions associated with the digital recorder or glucose sensor.

Precautions

If performing multiple CGMS *iPro* Digital Recorder studies on the same patient, establish a rotation schedule for choosing new glucose sensor sites. Avoid sites that are constrained by clothing, have scar tissue, or are subject to rigorous movement during exercise.

For additional information, please consult the *iPro* CGM user guides.

iPro™ is a trademark of Medtronic MiniMed, Inc.
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References

1. American Diabetes Association. *Diabetes Care*. 2010; 33(suppl 1):S11-S61.
2. Solutions® Software for CGMS® *iPro*™ Continuous Glucose Recorder User Guide.
3. Chico A, Vidal-Rios P, Subira M, Novials A. *Diabetes Care*. 2003;26:1153-1157.

Suggestion, Not Proof

The findings do not prove that insulin resistance may be a significant causal risk factor for stroke, independent of other factors, noted Dr. Graeme J. Hankey and Dr. Tan Ze Feng.

If insulin resistance is confirmed as a causal risk factor rather than just a marker of increased risk, the implications are exciting “because insulin resistance cannot only be measured but also treated,” they said.

Measuring insulin resistance in certain cases may help refine prognostic estimates of stroke risk. “Its measurement may have a role in particular cases in which traditional risk stratification schemes suggest that the patient is at intermediate risk of stroke ... and in whom an additional finding of insulin resistance may be sufficiently compelling to supplement lifestyle advice with pharmacological interventions to lower stroke risk,” they wrote.

DR. HANKEY AND DR. FENG are in the department of neurology at Royal Perth (Australia) Hospital. They reported no conflicts of interest. These comments are taken from their editorial (*Arch. Neurol.* 2010;67:1177-8).