RSNA® Radiological Society of North America

820 Jorie Blvd
Oak Brook, IL 60523
TEL 1-630-571-2670
FAX 1-630-571-7837
RSNA.org

NEWS

RSNA Press Release

MRI Identifies 'Hidden' Fat that Puts Adolescents at Risk for Disease

Released: February 27, 2007

Media Contacts:

RSNA Media Relations: (630) 590-7762

Maureen Morley
(630) 590-7754
mmorley@rsna.org

At A Glance

- Researchers are using single-slice MRI to locate internal fat in adolescents that could predispose them to disease later in life.
- Internal fat around the abdominal organs may be more dangerous than fat beneath the abdominal wall.
- Standard methods used to estimate body fat can be imprecise or expose children to unnecessary radiation.
- Ability to accurately measure abdominal fat may substantially advance strategies for achieving healthy weights in children.

OAK BROOK, Ill.—According to a new study featured in the March issue of Radiology, single-slice magnetic resonance imaging (MRI) is a fast, non-invasive way to measure intra-abdominal fat, which when excessive, may put children and teenagers at risk for developing heart disease, diabetes and other illnesses.

Unlike the fat that lies just beneath the abdominal wall, forming skin folds or "love handles," internal fat located in and around the abdominal organs may actually be more damaging, predisposing children to adult diseases.

"Because metabolic abnormalities appear to be more closely associated with intra-abdominal fat tissue, it is critical to be able to reliably and accurately assess this fat tissue in order to identify children at risk," said the study's lead researcher Marilyn J. Siegel, M.D., professor of radiology and pediatrics at Mallinckrodt Institute of Radiology, Washington University School of Medicine in St. Louis, Missouri.

Results from the 2003-2004 National Health and Nutrition Examination Survey found that an estimated 18.8 percent of children (age 6 to 11) and 17.4 percent of adolescents (age 12 to 19) in the United States are overweight.

Current methods used to estimate body fat include anthropometry, which involves physical measurements including waist circumference, abdominal height and body mass index, and dual energy absorptiometry (DEXA), a whole-body scan that distinguishes lean mass from fat tissue. However, anthropometry is imprecise and DEXA requires exposure to ionizing radiation.

In Dr. Siegel's study, 30 adolescents had fat tissue measurements taken using

Copyright © 2016 Radiological Society of North America (RSNA)

anthropometry, DEXA and single-slice and whole-abdominal, multi-slice MRI. The study's 20 boys and 10 girls were between the ages of 10 and 18 and included nine overweight but non-diabetic individuals, 10 Type-2 diabetic and overweight patients, and 11 normal weight, non-diabetic adolescents. The single-slice and multi-slice MRI measurements were compared and tested for correlations with anthropometric and DEXA measurements.

"Single- and multi-slice MRI measurements for assessing body fat distribution strongly correlated with clinical and DEXA measures," Dr. Siegel said. "The single-slice MRI, which takes just a few seconds, characterized body fat as well as the multi-slice exam."

While all participants had similar fat distribution patterns with a predominance of fat in the tissue of the abdominal wall, the total amount of fat tissue varied. Overall fat volume was highest in the diabetic, overweight adolescents.

According to Dr. Siegel, fat tissue estimation through single-slice MRI is simple, fast and could be useful in many clinical and research applications, including patient management, monitoring interventions, and implementing multi-center clinical trials or epidemiologic studies.

"Our ability to accurately measure abdominal fat may substantially advance strategies for achieving healthy weights in children," she said.

# # #

Radiology is a monthly scientific journal devoted to clinical radiology and allied sciences. The journal is edited by Anthony V. Proto, M.D., School of Medicine, Virginia Commonwealth University, Richmond, Va. *Radiology* is owned and published by the Radiological Society of North America, Inc. (radiology.rsna.org)

The Radiological Society of North America (RSNA) is an association of more than 40,000 radiologists, radiation oncologists, medical physicists and related scientists committed to promoting excellence in radiology through education and by fostering research, with the ultimate goal of improving patient care. The Society is based in Oak Brook, Ill. (RSNA.org)

"Measurement of Total and Intra-abdominal Fat Distribution in Adolescents by Magnetic Resonance Imaging." Collaborating with Dr. Siegel on this paper were Charles F. Hildebolt, D.D.S., Ph.D., Kyongtae T. Bae, M.D., Cheng Hong, Ph.D., M.D. and Neil H. White, M.D., C.D.E.

Copyright © 2016 Radiological Society of North America (RSNA)