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

Anorexia May Cause Emphysema, Study Suggests

Released: December 3, 2003

Media Contacts:

Heather Babiar or Maureen Morley	**(630) 590-7762**
Heather Babiar (630) 590-7738 hbabiar@rsna.org	Maureen Morley (630) 590-7754 mmorley@rsna.org

At A Glance

- For the first time, researchers, using computed tomography (CT) to analyze the lungs of patients with anorexia nervosa, found that malnutrition changes the structure of the lung.
- NIMH reports that up to 3.7 percent of female Americans suffer from anorexia at some time.

CHICAGO — Malnutrition resulting from anorexia nervosa may cause emphysema, according to research presented today at the 89th Scientific Assembly and Annual Meeting of the Radiological Society of North America (RSNA).

For the first time, researchers used a new method of assessing computed tomography (CT) scans to analyze the lungs of anorexic patients and found that malnutrition changes the physical structure of the lung. "There is a reduction in the amount of lung tissue in patients with anorexia nervosa," said Harvey O. Coxson, Ph.D., lead author of the study from Vancouver General Hospital (VGH) in Canada.

"It is unclear whether these structural changes are permanent," he said, "but if they are, early therapy is important in patients who have anorexia." Dr. Coxson is an assistant professor of radiology at the University of British Columbia and an investigator at the Vancouver Coastal Health Research Institute at VGH and at the James Hogg iCAPTURE Centre for Cardiovascular and Pulmonary Research at St. Paul's Hospital in Vancouver.

Anorexia nervosa, which primarily affects young women, is an eating disorder characterized by voluntary starvation. The National Institute of Mental Health reports that between 0.5 and 3.7 percent of female Americans will suffer from anorexia during their lifetime. Eighty-six percent of patients report disease onset before age 20. In severe cases, the lack of nourishment to the body can result in serious heart, kidney and liver damage. "Anorexia nervosa is the purest form of malnutrition," Dr. Coxson said.

For this study, Dr. Coxson and colleagues compared CT findings from 14 patients diagnosed with anorexia nervosa and 16 control patients. None of the patients had a family history of lung disease. In addition to providing detailed images, CT measured the absorbance of x-rays within the lung. The x-ray absorbance values were then converted to measurements of lung structure and were compared to clinical factors, such as body mass index and results of breathing tests. "These x-ray absorbance values are very sensitive and provide detailed measurements of lung structure even before major abnormalities can be visually identified

Copyright © 2014 Radiological Society of North America (RSNA)

by radiologists," Dr. Coxson said.

The findings indicated that the lung structure of the anorexic patients differed from that of the control patients, with a loss of some of the tissue that helps deliver oxygen to the rest of the body. Similar changes are evident in patients with emphysema caused by cigarette smoking, and produce shortness of breath and other respiratory problems.

"These results may influence the timing of nutritional support for anorexia patients to avoid or reverse this damage to the lung," Dr. Coxson said. "Further, if malnutrition causes emphysema in anorexic patients, it may contribute to emphysema in smokers. If so, nutritional treatment may slow the development of emphysema in smokers."

Previously published animal studies have suggested a correlation between malnutrition and emphysema. But until the advent of CT, the diagnosis of emphysema relied on the pathologic examination of lung tissue. According to Dr. Coxson, a study conducted by Jewish physicians in the Warsaw Ghetto during the Nazi occupation showed that 13.8 percent of people who died of starvation had emphysema at autopsy and 68 percent of those were under the age of 50. A much higher rate of emphysema than would be expected in people under the age of 50, this was the first evidence linking emphysema to malnutrition.

"Using CT, we are able to noninvasively assess the structure of the lung in living patients and study these disease processes early in their development," Dr. Coxson said.

Dr. Coxson's co-authors are Ida H.T. Chan, C. Laird Birmingham, M.D., John R. Mayo, M.D., Paola V. Nasute-Fauerbach, M.D., and Yasutaka Nakano, M.D., Ph.D. Dr. Coxson is a Parker B. Francis Fellow in Pulmonary Research. (J.M. received a grant from GE Medical Systems, Canada.)

This study was funded by a research grant from the British Columbia Lung Association.

RSNA is an association of more than 35,000 radiologists, radiation oncologists 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.

Download
Hi-res. Image

CT image of a control subject at the level of the aortic arch. Notice the uniform gray appearance of the lung tissue

Download
Hi-res. Image

Copyright © 2014 Radiological Society of North America (RSNA)

CT image at the level of the aortic arch of a subject with classic centrilobular emphysema. Notice the dark regions within the gray lung tissue.

Download
Hi-res. Image

CT image at the level of the aortic arch of a subject with a relatively normal body mass index (BMI = 24). Notice the uniform gray appearance of the lung tissue.

Download
Hi-res. Image

CT image at the level of the aortic arch of a subject with a relatively low body mass index (BMI = 12). Notice the "darker" appearing lung tissue.

Composite of figures 1-4.

Download
Hi-res. Image

Screen capture of lung analysis software.

View related abstract:

The Measurement of Lung Structural Changes due to Anorexia Nervosa Using Computed Tomography

# # #

Copyright © 2014 Radiological Society of North America (RSNA)