Oxidative stress may predict later lung trouble in young adults

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Markers of oxidative stress may predict future lung trouble, according to new research to be presented at the American Thoracic Society's 2008 International Conference in Toronto on Wednesday, May 21.

Certain measures of oxidant stress are positively associated with declines in lung function five years down the road, and those declines are indicative of the possible onset of lung disease such as chronic obstructive pulmonary disease (COPD).

Researchers used data from National Heart, Lung, and Blood Institute's longitudinal cohort study, CARDIA (Coronary Artery Risk Development in Young Adults), which followed a more than 5,000 young adults between the ages of 18 and 30, assessing different markers of coronary health at two, five, seven, 10, 15 and 20 years from baseline.

In this analysis, investigators examined markers of oxidant stress, including oxidized low density lipoprotein (oxLDL), a modified form of LDL as a result of lipid peroxidation by oxygen free radicals, and F2-isopostanes, a by-product of oxidant-mediated destruction of cellular membranes, both measured in year 15 of the CARDIA study, and compared them to the lung function results in year 20 in almost 2,000 healthy adults.

"Our principle finding was that the highest levels of oxLDL at year 15 of the cohort were associated with the lowest forced expiratory volume in one second (FEV1) at year 20, which is a measure of airflow

obstruction, one of the defining features of COPD and lower forced vital capacity (FVC), a measure of total lung capacity," said Ravi Kalhan, M.D., M.S., assistant professor of medicine and director of the COPD program at Northwestern University Feinberg School of Medicine, senior author of the study. "In addition, individuals with highest levels of F2-isoprostaines had a trend towards having lower FEV¬¬¬1 and FVC."

When they looked at these associations by gender, they found that they were markedly present in women, but not in men, which may be a step toward greater understanding of the gender disparity among COPD patients. "Women develop COPD more often than men, but we do not have a sense as to why," explained Dr. Kalhan. "Exploring whether women have increased vulnerability to COPD or other lung diseases because of more oxidant stress could open the door to new therapies to modify the risk of developing the disease."

The findings also may indicate a new way to predict and possibly prevent COPD in general. "We have not shown that oxidant markers can predict future COPD, [but] the association between their levels and lower lung function serves as a first step in determining whether they may be useful," said Dr. Kalhan. "Because only the minority of smokers develop COPD, it would be a huge step forward if we could predict future development of COPD among individuals at risk."

Source: American Thoracic Society

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