Heavy breathing -- an obscure link in asthma and obesity

August 29 2008

There is a strong link between obesity and asthma and as the prevalence of both conditions has been increasing steadily, epidemiologists have speculated that there is an underlying condition that connects the two. But one long-suspected link, the systemic inflammation associated with obesity, has been ruled out by a recent New Zealand study that found no evidence of its involvement.

"We were disappointed not to find a 'smoking gun' that would explain the common association between obesity and asthma," said lead researcher, D. Robin Taylor, M.D., of the University of Otago in New Zealand. "However, this research points us to other possibilities that future research should examine."

The results were reported in the first issue for September of the *American Journal of Respiratory and Critical Care Medicine*, published by the American Thoracic Society.

"We hypothesized that the low-grade systemic inflammation present in obesity would augment the inflammation of asthma (a synergistic effect)," wrote Dr. Taylor. "Or alternatively, that the inflammation of obesity might affect the airways independently (an additive effect), perhaps resulting in mixed airway inflammation."

In order to determine if there was indeed an interaction between systemic and local inflammation, the researchers recruited 79 women—20 who were obese with asthma, 19 who were of a normal

weight with asthma, 20 who were obese but who did not have asthma and 20 controls.

Asthmatics were told to stop using their anti-inflammatory inhaler treatment to avoid confounding effects until "loss of control." After the withdrawal period of four weeks, subjects underwent blood tests and tests for biomarkers of systemic and airway inflammation, such as C-reactive protein (CRP) and cytokines in blood and inflammatory cells and cytokines in sputum. Those that are known to be relevant in both obesity and asthma were chosen. The researchers then analyzed for interactions between systemic and airway-specific markers of inflammation.

"What we found was that although inflammatory cells and other biomarkers of inflammation were increased, there was no significant interaction demonstrated between obesity and asthma," said Dr. Taylor.

Although their inflammation hypothesis was not supported by their results, Dr. Taylor points out that it does provide valuable direction for future research. "This does not change the fact that there is a well-established link between asthma and obesity. Sometimes a negative result is important, and the results add to our body of knowledge regarding the obesity-asthma link. Now we need to look in other directions for the answers."

Animal studies suggest that changes in innate immunity may occur with obesity. "We did not look at this in our patients. Given that asthma is immunologically driven, this is a potential avenue for further research," said Dr. Taylor. "Alternatively, it may be that dynamic changes in lung function that occur with episodes of asthma are different with excess body weight."

Whatever the link is, uncovering it will have important clinical

implications. "Obese patients with asthma are more difficult to treat because their response to bronchoconstriction is exaggerated and gives the impression that the asthma is worse," said Dr. Taylor. "They may well have worse symptoms, but not as a result of underlying airway inflammation. Still, the typical response is often to increase their inhaled anti-inflammatory therapy. This is unlikely to provide the answer and may even do harm. The answer lies in dealing with the obesity itself."

Source: American Thoracic Society