Stress test may help predict increased mortality risk in sleep apnea patients

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Many studies have shown that men and women who suffer from obstructive sleep apnea (OSA) - a disorder that causes breathing to halt intermittently during sleep – have a higher mortality rate than those who do not have the disorder. Now, a study from researchers at the Cleveland Clinic shows that OSA patients who also have poor functional capacity have an even greater risk of mortality and suggests that an assessment of functional capacity in this population can help physicians identify patients most at risk for death.

The results of the study will be presented at the ATS 2013 International Conference.

Previous studies have linked impaired functional capacity (IFC) with increased mortality, but this study evaluated IFC and its impact within the context of the OSA population. The researchers also wanted to determine if IFC remained a predictor of increased mortality even among OSA patients without coronary artery disease (CAD), another factor shown to be linked with increased mortality. For this study, CAD risk was measured using the Duke Treadmill Score, or DTS, which evaluates an individual's capacity for exercise. Patients with abnormal DTS values were considered to have coronary artery disease.

"In our study, we sought to assess whether IFC is associated with increased mortality in patients with OSA and whether IFC is predictive of increased mortality after accounting for CAD," said study lead author Omar Minai, MD, staff physician in the Cleveland Clinic's Respiratory Institute and the Sleep Disorders Center. "We wanted to learn if the presence of IFC might be an effective tool in helping physicians identify which patients might have a higher risk for mortality."

For their study, the researchers reviewed the records of 1,533 OSA patients who had undergone both sleep testing, or polysomnography, and exercise stress tests utilizing echocardiograms within the prior three years. In addition to reviewing the data from the polysomnographs and echocardiograms, the researchers looked at demographic data, including smoking history, and comorbidities. Using this data, the investigators evaluated the association between IFC as determined by the stress echocardiogram and mortality within the total OSA patient population and found that overall, OSA patients with IFC were five times more likely to die than those without IFC.

Next, the researchers began identifying the variables that were associated with IFC in the total study population as well as in a subgroup of OSA patients without coronary artery disease. After compiling their data, they found that female gender, history of smoking, increased body mass index, presence of comorbidities, abnormal exercise echocardiogram, abnormal heart rate recovery following the stress test and abnormal Duke Treadmill Score were all predictive of IFC. They also looked at ejection fractions, a measurement of how well the heart is pumping, and found that lower ejection fractions – which indicate poorer heart function – were also predictive of IFC.

When data were adjusted to account for the presence of variables including heart rate recovery, DTS and sleep apnea severity, the researchers found that OSA patients with IFC still were 2.7 times more likely to die than OSA patients without IFC. Among those with normal DTS, patients with IFC had a mortality risk that was 4.3 times that of those with normal functional capacity. Finally, they looked at a subset of patients with both IFC and CAD and found that these patients had a higher mortality risk than patients who had only one of these factors.

"In our study population, IFC was a strong predictor of increased mortality, even among those with normal DTS," Dr. Minai said. "Clinically, this is important, because it suggests that, first, the addition of IFC may be able to improve the ability of

a stress test to predict mortality in OSA patients when DTS is normal and, second, it may also help identify a group of patients at especially high risk when IFC is found among patients with an abnormal DTS."

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