The American Academy of Asthma, Allergy, and Immunology (AAAAI) reports that 1 in 12 Americans have asthma. That’s about 25 million people in the United States alone. The key to most effectively treating asthmatics lies in a comprehensive consideration of potential contributing factors, obesity being one of them. The Center for Disease Control (CDC) supports that more than 1 in 3 adults in the United States are obese, amounting to more than 78 million people. The intersection of these two significant populations is gaining attention in asthma research, and Dr. Fernando Holguin at the Asthma Institute is investigating potential treatment options specifically for this growing population. Obese asthmatics respond differently to inhaled steroids (commonly used to treat asthma symptoms) and often experience more asthma exacerbations, most significantly in those with late onset asthma.

The link between asthma and obesity is supported by previous findings of an inverse relationship between body mass index (BMI) and reduced exhaled nitric oxide (NO). Knowing the exhaled nitric oxide level is helpful in assessing inflammation in the airways. Because inflammation is one of the two components of asthma, this test is a useful method for its diagnosis and management. The amount of nitric oxide that is exhaled in a steady, 10 second breath is measured with a small handheld machine. Essentially, patients with a higher weight to height ratio (a BMI greater than 30) showed a lower amount of exhaled nitric oxide collected by breath sample in one study.

Usually, higher levels of exhaled nitric oxide indicate airway inflammation, but in obese asthmatics, lower than expected levels of nitric oxide may be explained by a metabolic imbalance. The nitric oxide that we exhale is synthesized by an amino acid called L-arginine, and this amino acid has been found to be present in lower levels in the airways of obese asthmatics, reducing the availability for nitric oxide to be produced. This induces what is called oxidative stress, which may be responsible for the aggravation of asthma symptoms despite lower than expected levels of nitric oxide exhalation.

The purpose of this new study is to assess the effectiveness of the study compounds in obese asthmatics. The compounds have previously been shown to improve function in the cells lining the walls of blood vessels that undergo similar pathways for inflammation. The hope is that this treatment will reduce inflammation, reduce oxidative stress, and show an increase in nitric oxide exhalation, indicating an increased availability of this compound in the airways. Understanding the pathophysiology of asthma in obese patients is critical for the development of clinical trials to then develop better treatments. The additional stress placed on the respiratory system in patients with a higher BMI needs to be addressed as a factor in the treatment of asthma. The results from this study will hopefully prove to be useful in better understanding the pathways that contribute to the effects seen in these respiratory conditions, which will lead to more effective treatment for this population of asthmatics.