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Prebiotics drastically reduce severity of exercise-induced asthma, study shows

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The severity of exercise-induced asthma can be significantly reduced by taking prebiotics – food ingredients which target beneficial bacteria in the gut – according to new research.

The study, led by sport scientists at Nottingham Trent University and reported in the *British Journal of Nutrition*, provides further evidence of the important role that microbes living in the gut can play in health and disease.

Scientists found that consumption of a prebiotic supplement resulted in significant improvements in the severity of exercise-induced asthma in a cohort of physically active asthma sufferers.

After exercise individuals with asthma sometimes experience a reduction in their lung function as a result of airway constriction.

The researchers found that the level of airway narrowing was greatly reduced following three weeks of prebiotic supplementation. A significant reduction in the inflammation of the airways was also observed during the study.

Exercise-induced asthma involves a narrowing of the airways during or after exercise – leading to unpleasant and sometimes fatal symptoms such as shortness of breath, wheezing, coughing and a tightening of the chest.

More than five million people have asthma in the UK alone – 235 million worldwide – and exercise induced asthma can affect up to an estimated 90% of asthma patients. While there are effective drug therapies, these are not curative do not alter disease progression, and patients often stop using them.

Ten adults with exercise-induced asthma – as well as a control group – completed the study. The effects of the prebiotic supplement Bimuno-galactooligosaccharide (B-GOS) were compared to a placebo supplement that was identical in taste and texture in all participants. Participants took them for three weeks before crossing over onto the alternative supplement.

Participants undertook a hyperventilation test in the laboratory which causes the effects of exercise induced asthma. Exercise induced asthma is defined by a fall in lung function and the test causes a very similar response to that seen after exercise. The fall in lung function after the hyperventilation test were compared after three weeks of prebiotic B-GOS and placebo. Blood was also taken to study circulating markers of inflammation in the airways.

As well as dramatically reducing the severity of exercise-induced asthma, the researchers saw a significant reduction in the blood markers of airway inflammation. The prebiotic B-GOS was able to completely abolish the increase in some markers usually associated with airway constriction following exercise.

"Our study shows that this particular prebiotic could be used as a potential additional therapy for exercise-induced asthma," said lead researcher Dr Neil Williams, a lecturer in exercise physiology and nutrition in Nottingham Trent University's School of Science and Technology.

He said: "We are only just starting to understand the role the gut microbiome plays in health and disease – and it is becoming increasingly recognised that microbes living in the gut can have a substantial influence on immune function and allergies which is likely to be important in airway disease.

"B-GOS acts to increase the growth and activity of good bacteria in the gut. This in turn may reduce the inflammatory response of the airways in asthma patients to exercise. Importantly, the level of improvement in lung function that appears after the prebiotic is perceivable by the patient and therefore potentially clinically relevant."

More information: Neil C. Williams et al. A prebiotic galactooligosaccharide mixture reduces severity of hyperpnoea-induced bronchoconstriction and markers of airway inflammation, *British Journal of Nutrition* (2016). DOI: 10.1017/S0007114516002762

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