

LAY ABSTRACT

This proposal describes a clinical study that is designed to study the effects of the supplemental intake of enriched omega-3 polyunsaturated fatty acids in patients with moderate to severe asthma. Some asthmatics produce a large amount of inflammatory leukotriene proteins—proteins that contribute to wheezing and inflammation in the airway. Inhibiting the detrimental effects of leukotrienes is a key goal of controller therapy in severe asthmatics. Some asthmatic patients appear to have specific mutations of the arachidonate 5-lipoxygenase (ALOX5) gene, one gene that regulates the production of the inflammatory leukotrienes. Omega-3 fatty acids can interfere with the arachidonic acid pathway and decrease the production of leukotrienes, and this may benefit moderate and severe asthma patients. Our hypothesis is that omega-3 fatty acid supplements, added on to a patient's asthma medication regimen, can decrease the number of minor asthma exacerbations compared to patients who do not receive the supplement. Furthermore, we believe that asthma patients with specific ALOX5 gene mutations will benefit most. We will enroll 30 asthma subjects to take part in this trial. They will undergo genotyping of the ALOX5 gene and be treated with omega3-fatty acids and placebo over a nine month period. We expect that this strategy will allow us to discover which moderate and severe asthma patients will benefit most from supplements of omega-3 fatty acids. Treatment of chronic diseases, such as asthma, is a key mission of the Center of Health and Nutrition Research.