The Effect of N-Acetyl Cysteine on Alpha-Linolenic and Palmatic Acid Induced Oxidative Stress in Adipocytes

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Oxidant stress causes cell and tissue damage and is associated with fatal diseases such as diabetes, heart disease, asthma, and Alzheimer's. A high fat diet containing saturated fatty acids has been shown to increase oxidative stress. However, unsaturated fatty acids have been shown to be beneficial. We found that alpha linolenic acid (LNA) increased the level of reactive oxygen species (ROS) compared to the control, but this effect is significantly lower than its saturated counterpart palmitic acid (PA). The aim for this study was to evaluate the effect of antioxidant, N-acetyl cysteine (NAC) on the amount of ROS production. We hypothesized that the addition of NAC significantly decreased the amount of ROS. To test the affect of NAC, we treated differentiated rat adipocytes with 250μM of LNA or PA in the presence or absence of 20mM of NAC for 24hrs. We measured the ROS using fluorescent dye 5(-and-6)-chloromethyl-2'7'-dichlorohydroflorescein deacetate acetyl ester (CM- H_2DCFDA Molecular Probes). Our results show that NAC prevented the PA and LNA induced reactive oxygen species production that was detected by the dye.