

Consumption of a High-Fat Meal Increased Monocyte Adhesion Molecule Expression and oxLDL Phagocytosis: Implications for Cardiovascular Disease Risk?

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Category: Doctoral

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ABSTRACT

Macrophage-derived foam cells are the predominant component of arterial plaques in the early stages of atherosclerosis. The deposition of arterial plaques is effected by several factors that are influenced by a person's daily nutritional habits. One factor that poses a major risk for plaque development is high levels of plasma LDL resulting from the consumption of a high-fat meal. In order to understand how an individual's diet effects arterial plaque deposition via the process of foam cell formation, we measured the acute response in circulating monocyte activity after consuming a high-fat meal. Samples were acquired on a FlowSight (EMD Millipore) equipped with 405, 488, 642, and 785 nm lasers. Samples were analyzed in IDEAS software to identify pro-inflammatory (CD14+/16+) and classic (CD14+/16-) monocytes. We measured monocyte concentration, adhesion molecule expression, scavenger R expression, and oxLDL phagocytosis for 5 h postprandial. We found that consuming a high-fat meal caused an increase in pro-inflammatory monocyte concentration, adhesion molecule expression, monocyte phagocytosis of oxLDL, and CD36 expression in pro-inflammatory monocytes. These results suggest that consuming a high-fat meal increases the potential of monocytes to become foam cells for at least 5 h postprandial.