

The Role of Cholesterol and Fatty Acids on Intestinal Apo A-IV Synthesis and Secretion

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Background: Apo A-IV is one of the major apolipoproteins that is synthesized and secreted in response to the absorption of lipid by the small intestine. Apo A-IV is proposed to be involved in the formation and secretion of chylomicrons, lipoprotein metabolism, control of food intake, gastric function, prevention of atherosclerosis, and preventing the oxidation of lipoproteins. Previous studies demonstrated that Apo A-IV synthesis and secretion is stimulated by the absorption of long chain fatty acids, but not short chain fatty acids, through the formation of chylomicrons.

Hypothesis/Aims: We hypothesized that cholesterol absorption stimulates Apo A-IV synthesis and secretion by the small intestine. The aim of this project was to infuse medium chain fatty acids, with and without cholesterol added, into the duodenum of lymph fistula rats to determine if Apo A-IV synthesis and secretion was stimulated by cholesterol. Compared with the infusion of medium chain fatty acids alone, which do not stimulate chylomicron formation, it can be determined if cholesterol will stimulate Apo A-IV synthesis and secretion.

Methods: Two groups of non-bile diverted lymph fistula rats (n=7 in each group) were studied. The control group received medium chain fatty acid without cholesterol. The experimental group received medium chain fatty acid with cholesterol. Lymph samples were collected before the infusion, and then hourly for 8 hours. The lymph was sampled for Apo A-IV, triglyceride, and cholesterol content.

Results: The lymphatic Apo A-IV output did not differ significantly between rats infused with medium chain fatty acids with and without cholesterol ($p > 0.05$, not significant for all time points tested).

Conclusion: Cholesterol absorption is not a signal for the stimulation of Apo A-IV synthesis and secretion by the small intestine.