Effect of carbohydrate- and protein-rich meals on exercise-induced activation of lipolysis in obese subjects.

Abstract:
Exercise is an important part of obesity treatment concepts to support fat mobilisation from adipose tissue and also fat oxidation which is impaired in obese subjects. In normal weight subjects it is well known that stimulation of plasma insulin levels by a carbohydrate meal can inhibit lipolysis and subsequent fat oxidation. Since obese subjects frequently have elevated basal and postprandial insulin levels the effect of carbohydrate- and protein-rich test meals on exercise-induced activation of lipolysis is of special interest. Twenty obese subjects performed bicycle exercise for 30 min in the fasted state, 30 min after a carbohydrate-or a protein-rich meal, and 120 min after the carbohydrate meal (n=12), respectively, at low intensity. Activation of lipolysis was assessed by plasma glycerol levels. In addition, plasma insulin, glucose, and lactate concentrations were determined. In comparison to the fasted state, the carbohydrate meal suppressed activation of lipolysis. Following the protein meal, exercise led to an attenuated but significant increase of glycerol levels. A similar rise was observed when the carbohydrate meal was ingested 2 h prior to the exercise bout. To improve exercise-induced lipolysis and subsequent fat oxidation during low-intensity exercise obese subjects should not ingest carbohydrates immediately before exercise. Hunger sensations should be satisfied with protein-rich food. When carbohydrates
are consumed 2 h prior to exercise its lipolytic effect is comparable to the protein meal. These data are useful in every day dietary counselling and might help to improve weight loss during obesity treatment.