【国際セッション・基調講演2】

Exercise and appetite regulation

Dr David Stensel, PhD

Senior Lecturer in Exercise Physiology
School of Sport, Exercise and Health Sciences
Loughborough University
United Kingdom

The discovery of the orexigenic (appetite stimulating) hormone ghrelin has led to increased interest into the effects of exercise on appetite regulation. Changes in ghrelin concentrations during and/or after exercise may mediate changes in appetite and these changes may in turn have implications for weight control and the prevention/management of obesity. A particular focus of recent studies has been the effects of exercise on acylated ghrelin because acylation of ghrelin is thought to be essential to enable the hormone to cross the blood-brain barrier and stimulate appetite (via the hypothalamus). Studies conducted at Loughborough University have demonstrated that acute bouts of moderate to high intensity running suppress acylated ghrelin and hunger and the duration of this suppression is directly related to the duration of exercise. Suppressions of acylated ghrelin and hunger have also been observed in subjects performing a 90 minute weight lifting session and in participants completing a one hour swim. Short bouts (up to one hour) of low intensity exercise, specifically walking, do not appear to influence acylated ghrelin or hunger. In cases where ghrelin and hunger are suppressed with exercise values return to baseline soon after the end of exercise. Having established that acylated ghrelin is often transiently suppressed during exercise recent studies have attempted to link post-exercise changes in acylated ghrelin with changes in food intake by feeding subjects one or more buffet type meals during post-exercise observation periods lasting from several hours up to one day. Surprisingly these studies have failed to detect any increase in appetite, food intake or acylated ghrelin (beyond that observed in resting control trials) despite the energy deficit created by exercise. These findings suggest that regular exercise should be an effective means of controlling hunger and weight although longer observation periods are required to confirm this. Aside from ghrelin several other gut hormones are important for appetite regulation including peptide YY (PYY), oxyntomodulin and glucagon like peptide-1 (GLP-1). These hormones are anorexigenic and therefore suppress appetite. In addition to stimulating changes in ghrelin exercise may influence other gut hormones and recent work indicates that moderate to vigorous intensity running transiently increases PYY concentrations (suggesting another mechanism by which exercise may suppress appetite). Changes in gut hormones may also underlie the reductions in appetite which are often experienced by individuals (e.g. mountaineers) ascending to high altitude and this is a focus of current work.

This event has been kindly supported by The Great Britain Sasakawa Foundation, an initiative of University of Tsukuba.