

Acute Effects of Exogenous Hormone Treatments on Postprandial Acylation Stimulating Protein Levels in Ovariectomized Rats After a Fat Load

Authors : Bashair Al Riyami

Abstract : Background: Acylation stimulating protein (ASP) is a small basic protein that was isolated based on its function as a potent lipogenic factor. The role of ASP in lipid metabolism has been described in numerous studies. Several association studies suggest that ASP may play a prominent role in female fat metabolism and distribution. Progesterone is established as a female lipogenic hormone, however the mechanisms by which progesterone exert its effects are not fully understood. AIM: Since ASP is an established potent lipogenic factor with a known mechanism of action, in this study we aim to investigate acute effects of different hormone treatments on ASP levels in vivo after a fat load. Methods: This is a longitudinal study including 24 female wister rats that were randomly divided into 4 groups including controls (n=6). The rats were ovariectomized, and fourteen days later the fasting rats were injected subcutaneously with a single dose of different hormone treatments (progesterone, estrogen and testosterone). An hour later, olive was administered by oral gavage, and plasma blood samples were collected at several time points after oil administration for ASP and triglyceride measurements. Area under the curve (TG-AUC) was calculated to represent TG clearance Results: RM-ANCOVA and post-analysis showed that only the progesterone treated group had a significant postprandial ASP increase at two hours compared to basal levels and to the controls (439.8 ± 62.4 vs 253.45 ± 59.03 ug/ml), $P= 0.04$. Interestingly, increased postprandial ASP levels coordinated negatively with corresponding TG levels and TG-AUC across the postprandial period most apparent in the progesterone and testosterone treated groups that behaved in an opposite manner. ASP levels were 3-fold higher in the progesterone compared to the testosterone treated group, whereas TG-AUC was significantly lower in the progesterone treated group compared to the testosterone treated group. Conclusion: These findings suggest that progesterone treatment enhances ASP production and TG clearance in a simultaneous manner. The strong association of postprandial ASP levels and TG clearance in the progesterone treated group support the notion of a stimulatory role for progesterone on ASP mediated TG clearance. This is the first functional study to demonstrate a cause-effect relationship between hormone treatment and ASP levels in vivo. These findings are promising and may contribute to further understanding the mechanism of progesterone function as a female lipogenic hormone through enhancing ASP production and plasma levels.

Keywords : ASP, lipids, sex hormones, wister rats

Conference Title : ICBCR 2014 : International Conference on Biomarkers and Clinical Research

Conference Location : Istanbul, Türkiye

Conference Dates : November 28-29, 2014