Effect of oleoylethanolamide in an animal model of binge eating and in a model of reinstatement of high-fat food seeking

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Oleoylethanolamide (OEA), is an endogenous lipid, which, despite its structural and similar biosynthetic pathways to anandamide, shows opposite effects on feeding and lipid metabolism regulation. In the recent years, OEA has clearly emerged as a potential novel pharmacological target for the development of therapies aimed at controlling aberrant eating patterns, such as those causing obesity and/or eating disorders.
The main purpose of this study was to evaluate the effect of OEA in an animal model of binge eating and in a model of self administration of high-fat food and reinstatement of high-fat food seeking, after extinction.
Binge eating episodes are characterized by uncontrollable, distressing eating of a large amount of highly palatable food. These episodes represent a central feature of bingeing-related eating disorders, such as binge eating disorder, bulimia nervosa, and binge/purge subtype anorexia nervosa.
In our animal model of binge eating we used four groups of female rats that were first exposed or not exposed to repeated intermittent cycles of regular chow food restriction during which they were also given intermittent access to highly palatable food. On the test day, we either exposed or did not expose the rats to the sight of the palatable food for 15 min (frustration stress) before assessing food consumption for 2 h.
To investigate the effect of stress-induced relapse to unhealthy eating habits during dieting, we adapted a rat reinstatement model, commonly used to study relapse to abused drugs.
OEA showed its anorectic action in the preclinical models, these effects could be due to the induction of satiety and activation of the nuclear receptor PPAR-alpha, being considered an endogenous agonist for this activity.
Moreover, since the administration of OEA induces an increase in expression and neurosecretion of oxytocin in the hypothalamus, the increase of this hormone in our animal models may mediate the downregulation of CRF system, involved in the episodes of binge eating and in reinstatement of palatable food seeking.
In conclusion, OEA could be a promising candidate for the treatment of these maladaptive eating habits.