Anticipatory and consummatory effects of (Hedonic) chocolate intake are associated with increased circulating levels of the orexigenic peptide ghrelin and endocannabinoids in obese adults

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Hedonic hunger refers to consumption of food just for pleasure and not to maintain energy homeostasis. Recently, consumption of food for pleasure was reported to be associated with increased circulating levels of both the orexigenic peptide ghrelin and the endocannabinoid 2-AG in normal-weighted subjects. To date, the effects of hedonic hunger, and in particular of chocolate craving, on these mediators in obese subjects are still unknown. To explore the role of some gastrointestinal orexigenic and anorexigenic peptides and endocannabinoids (and the related congeners) in chocolate consumption, we measured changes in circulating levels of ghrelin, GLP-1, PYY, AEA, 2-AG, PEA) and OEA in 10 satiated severely obese subjects after consumption of chocolate (choco) and, on a separate day, of a non-palatable isocaloric food (npfood) with the same bromatologic composition. Evaluation of hunger and satiety was also performed by visual analogic scale. The anticipatory phase and the consumption of food for pleasure were associated with increased circulating levels of ghrelin (AUCchoco: 110488.2±9905.7 pg/ml×min vs AUCnpfood: 87651.1±8611.8 pg/ml×min, $p<0.05$), AEA (T60choco: 5.1±1.5 pmol/ml vs T60npfood: 3.7±1.0 pmol/ml, $p<0.05$), 2-AG (T60choco: 5.7±4.3 pmol/ml vs T60npfood: 2.8±1.0 pmol/ml, $p<0.05$) and OEA (T60choco: 37.1±13.3 pmol/ml vs T60npfood: 28.5±9.5 pmol/ml, $p<0.05$). By contrast, the levels of GLP-1, PYY and PEA did not differ before and after the exposure/ingestion of either chocolate or non-palatable foods. Hunger and satiety were higher (T70choco: 37.0±21.2 mm vs T70npfood: 24.5±26.5 mm, $p<0.05$) and lower (T70choco: 46.5±26.5 mm vs T70npfood: 64.5±26.7 mm, $p<0.05$), respectively, in the hedonic session than in the non-palatable one. In conclusion, when motivation to eat is generated by highly palatable food, a peripheral activation of specific endogenous rewarding chemical signals, including ghrelin, AEA and 2-AG, is observed in obese subjects. These preliminary findings seem to suggest the possible effectiveness of ghrelin and endocannabinoid antagonists in the treatment of obesity.