Biofeedback of Heart Rate Variability Reduces Food Cravings in High Food Cravers

Introduction

Cardiac autonomic regulation has been suggested as a physiological endophenotype of self- and emotion regulation [1]. Reduced vagally mediated heart rate variability (HRV) has been found in affective disorders [2]. In substance use and eating behavior, reduced HRV has been related to intense experiences of craving [3,4]. HRV-biofeedback has been found to reduce symptoms in psychiatric disorders [5]. We hypothesized that an HRV-biofeedback training would reduce food cravings in participants who frequently experience such cravings.


Method

An online screening was conducted to recruit subjects with high or low food cravings using the subscale lack of control over eating of the Food Cravings Questionnaire - Trait (FCQ-T) [1]. Participants were divided in two groups of high cravers (n = 28) and a group of low cravers (n = 28). One group of high cravers (n = 14) performed 12 sessions of HRV-biofeedback [2] using the Stresspilot (Fig. 1), while the control groups of high and low cravers received no intervention. The FCQ-T and other questionnaires were administered before and after HRV-biofeedback treatment (T1, T2). Heart rate was recorded at rest at T1 and T2 and vagally mediated HRV was calculated [RSAnorm = 100 x (HF power)^1/2/(mean RR interval)].


Discussion and Conclusion

Self-reported food cravings as well as eating and weight concerns decreased from pre- to post-measurement in high cravers practicing HRV-biofeedback. However, an increase in HRV could not be achieved. A possible explanation could be the young age (M = 24.1 years, SD = 3.8) and good health status (BMI: M = 22.7 kg/m^2, SD = 3.2) of our sample. Nonetheless, HRV decreased in the craving-control group and, therefore, HRV-biofeedback might have prevented such a decrease in the intervention group. Future studies could examine the effectiveness of HRV-biofeedback in eating disorder and obese patients. Furthermore, future studies need to include appropriate control conditions (placebo or alternative relaxation technique). Despite limitations, this study provides first evidence that an HRV-biofeedback training could be beneficial for normalizing dysfunctional eating behavior.


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