Are Stress Eaters at Risk for the Metabolic Syndrome?

ELISSA EPEL, SHERLYN JIMENEZ, KELLY BROWNELL, LAURA STROUD, CATHERINE STONEY, AND RAY NIAURA

UCSF Health Psychology Program, San Francisco, California 94143, USA

ABSTRACT: Stress eating is a health behavior that has been overlooked in much of health psychology research. It is largely unknown why some tend to eat during or after stressful periods, whereas others tend to lose their appetite and lose weight. Furthermore, it is unknown if such transient changes in food intake or macronutrient composition during stress have clinically significant consequences in terms of weight and metabolic health. The Brown University Medical Student Study examined students during a baseline control period as well as during two examination periods. This design enabled an examination of weight changes in self-proclaimed stress eaters vs stress-less eaters over time. Stress eaters tended to gain more weight and demonstrated increases in nocturnal levels of insulin, cortisol, and blood levels of total/HDL cholesterol ratio, during exam periods, controlling for the baseline control period. These data show prospectively that stress eating may indeed have short-term consequences on metabolic health. Future research will need to determine whether this confers a greater risk of disease over time.

KEYWORDS: stress; eating; metabolic syndrome; weight gain

INTRODUCTION

Stress causes some people to eat less, others to eat more. The consequences of stress-eating are largely unknown. In rat models, chronic stress and high corticosterone lead to greater caloric intake of palatable food, which in turn leads to preferential deposition of abdominal fat. Similarly, in humans, an initial laboratory study showed that individuals who respond to stress with higher cortisol levels increase food intake during stress. In turn, those who eat more during stress may experience transiently greater insulin secretion, abdominal fat deposition, and other aspects of the metabolic syndrome. We tested these relations in medical students by examining the effects of self-reported stress-eating tendencies (more-eaters vs. less-eaters) on changes in cortisol, insulin, adiposity, and lipid levels as well as food intake from baseline to exam periods. We wished to examine if aspects of the metabolic syndrome would differ between those who report eating more vs. those who report eating less during stress.
METHOD

One hundred thirty-one medical students (55% women, mean age 23.75 years, range 20.8–36.1) were asked to report their stress-eating tendencies and were assessed on body mass index (BMI), waist-to-hip ratio (WHR), nocturnal urinary cortisol, and insulin during baseline and two exam periods over 1 year. Physiological data were averaged for the two exam periods.

RESULTS

Of the 131 who completed questionnaires, 81 students (62%) categorized themselves as consistently eating more or less during stress. Of these 81 students, 47 (36%) reported eating more than usual under stress (more-eaters) and 34 (26%) reported eating less than usual under stress (less-eaters). At baseline, the two groups did not differ in BMI, dietary intake, cortisol, insulin, and lipid levels. Multiple regression analyses investigated differences between the more-eaters and the less-eaters in health outcomes, controlling for baseline levels of each outcome as well as exercise level, age, gender, and baseline BMI. Figures show mean levels adjusted for covariates listed above. More-eaters showed increases in BMI, $F(1,70) = 13.19, P < .001$ (Fig. 1; eaters gained an average of 5 pounds). They also showed increases in nocturnal cortisol, $F(1,68) = 6.14, P < .02$, total/HDL cholesterol ratio, $F(1,67) = 4.34, P < .04$, and nocturnal insulin, $F(1,67) = 5.36, P < .02$ (Fig. 2) compared to less-eaters during the stress periods. WHR tended to increase in more-eaters, but only among women.

DISCUSSION

Although few changes in physiologic parameters were noted over the entire sample during exam periods, comparing stress-eating groups revealed differential
change between the two groups: increases in weight, cortisol, insulin, and lipid profile were noted during stress (exams), but only among stress more-eaters. Although it is not possible to determine causal pathways between eating, cortisol, insulin, and health outcomes in this study, it appears that habitually eating more during stressful periods (or at least reporting to do so) may be a risk factor for the development of metabolic syndrome over time. Longitudinal research is needed to determine whether increases are transient or cumulative over time.

REFERENCES