Chronic stress alters serum lipids: effects due to "stress eating" versus metabolic change

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Abstract

Background: Much research indicates that psychological stress can alter serum lipids, contributing to cardiovascular disease. However, this theory remains controversial. It is also unknown how this effect occurs: whether due to stress eating versus metabolic changes. This knowledge deficit impairs the understanding and clinical treatment of the increasingly ubiquitous patient experiencing stress and dyslipidemia.

Methods: We applied chronic stress to 24 LDL-receptor knockout mice for six weeks, and observed corticosterone, serum triglycerides, total and fractional cholesterol, and body weight. We used fed and fasted conditions to observe serum lipids with and without contribution from diet, as well when a highly-palatable food was available.

Results: Stressed mice consumed more highly palatable food, and gained significantly more body weight ($p=0.03617$) than did the unstressed mice. In agreement, both total cholesterol and triglycerides were significantly higher after providing sugar water, than prior to providing it ($p=0.0171$ and $p=0.0379$). We found several significant elevations in stressed mice's lipids, but these are difficult to interpret without observing larger trends, and given the habituation to the stressor that occurred.

Conclusion: These findings support our hypothesis that stress can raise serum lipids by promoting stress eating of highly-palatable food. This can promote dyslipidemia by causing weight gain and raising serum lipids, as occurred in our study. More research is needed regarding stress' ability to affect lipids in ways that are unrelated to diet.

Reference

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