Stress and the Individual:
Mechanisms Leading to Disease

Abstract

Objective: This article presents a new formulation of the relationship between stress and the processes leading to disease. It emphasizes the hidden cost of chronic stress to the body over long time periods, which act as a predisposing factor for the effects of acute, stressful life events. It also presents a model showing how individual differences in the susceptibility to stress are tied to individual behavioral responses to environmental challenges that are coupled to physiologic and pathophysiologic responses.

Data Sources: Published original articles from human and animal studies and selected reviews. Literature was surveyed using MEDLINE.

Data Extraction: Independent extraction and cross-referencing by us.

Data Synthesis: Stress is frequently seen as a significant contributor to disease, and clinical evidence is mounting for specific effects of stress on immune and cardiovascular systems. Yet, until recently, aspects of stress that precipitate disease have been obscure. The concept of homeostasis has failed to help us understand the hidden toll of chronic stress on the body. Rather than maintaining constancy, the physiologic systems within the body fluctuate to meet demands from external forces, a state termed *allostasis*. In this article, we extend the concept of allostasis over the dimension of time and we define *allostatic load* as the cost of chronic exposure to fluctuating or heightened neural or neuroendocrine response resulting from repeated or chronic environmental challenge that an individual reacts to as being particularly stressful.

Conclusions: This new formulation emphasizes the cascading relationships, beginning early in life, between environmental factors and genetic predispositions that lead to large individual differences in susceptibility to stress and, in some cases, to disease. There are now empirical studies based on this formulation, as well as new insights into mechanisms involving specific changes in neural, neuroendocrine, and immune systems. The practical implications of this formulation for clinical practice and further research are discussed. (Arch Intern Med. 1993;153:2093-2101)