Measurement of Salivary Cortisol and Salivary Alpha-Amylase Together Provide a More Complete Assessment of the Stress Response

Psychobiological studies investigating the nature of the stress response and its relations to human health and development have routinely measured salivary cortisol to assess the response of the hypothalamic-pituitary-adrenal (HPA) axis. Current theory suggests, however, that measurement across multiple stress systems will provide a more complete picture of the stress response, and Salimetrics now recommends that stress-related studies should include measures of both salivary cortisol and salivary alpha-amylase (sAA) as indicators of activity in the HPA axis and autonomic nervous system (ANS), respectively.

State College, PA (PRWEB) December 01, 2011 -- A recent internal survey of scientific literature carried out at Salimetrics has shown a sharp increase of interest in salivary alpha-amylase, an important enzyme found in saliva. This peak of interest is largely due to the use of this salivary component as a biomarker related to stress and nervous activity in psychobiological studies.

Previously, salivary cortisol has been the biomarker of choice in studies of this type since it represents the principal end-product of the hypothalamic-pituitary-adrenal (HPA) axis response to stress. The simple, non-invasive nature of saliva collection allows cortisol measurements to be carried out in everyday, ecologically valid social settings, which is difficult to do when blood sampling is used. Current theory suggests, however, that measurement of the stress biomarkers across multiple biological systems will provide a better understanding of the details of the stress response. Salimetrics is therefore encouraging researchers to include measurements of at least one additional stress biomarker in their studies.

Salivary alpha-amylase (sAA), an enzyme that is released into saliva in response to activity in the autonomic nervous system (ANS), is now the stress biomarker that is most often used in conjunction with cortisol. sAA has been studied by oral biologists for decades because of its digestive and anti-microbial functions. More recently, sAA has been widely discussed in psychology-related research because of its potential value as a surrogate marker of activity in the ANS. ANS measurements were previously impractical to include in most bio-behavioral studies because of the cost and complexity of the techniques and apparatus that were required to measure it.

Dr. Douglas A. Granger, founder of Salimetrics, in a review of research on sAA as a biomarker of stress, stated that “A small, but growing literature reveals age-, gender-, and stress-related differences in salivary alpha-amylase levels, patterns of intraindividual salivary alpha-amylase change in response to challenge that distinctly differs from those measured by salivary cortisol. In addition, findings suggest associations between salivary alpha-amylase levels and social behavior and relationships, health, cognitive/academic problems, and cardiovascular activity. These findings underscore that integration of noninvasive measurements of the adrenergic component of the locus ceruleus/autonomic nervous system, as indexed by salivary alpha-amylase, may extend our understanding of health-related biobehavioral phenomena.”(1)

The current literature contains a growing number of studies that measure both cortisol and sAA, and these are providing important information on the nature of the interactions between the HPA and ANS systems in response to different types of stress or in connection with various psychological conditions. (2-4)
References


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Contact Information
Chris Schwartz
Salimetrics
http://salimetrics.com
814-234-7748 210

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