RESEARCH ARTICLE

Allostatic Load: Unique Orientation Towards Atherosclerotic Cardiovascular Diseases

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Abstract

Health is the potential of a man or a woman to adapt and successfully reply to the dynamic problems of being alive. Disease is the situation in which physiological parameters abruptly finds its way towards abnormal ranges, which fluctuates the homeostatic conditions and tilts towards allostasis, which provides 'stability via change', by controlling the set-points of physiological parameters to meet the demands of stress and to acquiesce in with the system. To emphasize, it's a contribution to atherosclerotic cardiovascular disease, is vital, as many of its predisposing elements show up to exert their outcomes as long-term effects.

Keywords: Allostasis, Atherosclerotic, Cardiovascular.

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Introduction

Allostasis is the stage where a set of control points differ past the limits of homeostatic mechanisms and are the reasons for the production of wear and tear in the brain and body.[1] It manifests the first initiators of the allostatic physiological reaction, such as the parameters of the hypothalamus-pituitary-adrenal axis and sympathetic adrenal medullary axis to be triggered.[2] It relates to the involvement of the autonomic nervous system and the adrenocortical system that protects the body within a quick period, but later causing harmful disease damage due to being active for a prolonged duration.[3]

The four response patterns to the environmental challenge are repeated insults leading to allostasis over time, organisms not able to habituate to demanding stressful stimuli, response pattern in which physiologic system remain at the heightened stage of an activation without recovery and the inadequate primary adaptation mechanisms to meet the task.[4] It is an essential refutation mechanism for safeguarding the cells from stress factors, such as ischemia, inhibitors of energy metabolism, oxidative stress, inflammation, which depending on severity and duration, can cause cell death by apoptosis or necrosis.[5]

Allostasis burden induced by dysregulation of allostasis lead to allostatic dysfunction[6] and focuses on the biphasic effects (protective and harmful) of the biological mediators of allostasis. This is an active process that leads to adaptation, which would help the body to adapt to a changing environment but can also cause a cumulative load of pathophysiology.[7] It is related to primary mediators of the neuroendocrine system, that triggers to physiological processes, which ultimately increases circulating levels of glucose and lipids, by promoting postprandial hyperglycaemic excursions and chronic metabolic oversupply, which would eventually induce biological damage as stated by Picard *et al*., 2014 and inevitably, cardiovascular diseases.[8]

The concept of allostatic load derives from a consistent, prolonged cumulative view of allostasis and the consequences of dysregulation in patterns of response to environmental needs and anticipations. Allostasis load represents the successfully gaining force of leading to physiological cost leading to wear and tear, which displays infirmity risks, throughout multiple systems over time. It displays the ordinary total accumulative burden of physiological dysregulation in allostatic procedures throughout as many regulatory systems as feasible.[9] This leads to allostatic load and allostatic over load,[10] which refers to the consequences of sustained or repeated activation of mediators of allostasis.[11] Allostatic load is the price the body can pay for being forced to adapt to destructive psychosocial or bodily situations. It represents either the presence of too much stress or inefficient operation of the stress hormone response system.[6]

A distinction highlighted by Robertson, Beveridge and Bromley (2017), is that not be a useful predictor for a specific cause of demise, and this thought to reduce the ability of Allostasis load to serve as a predictive disease device.[12] It requires further institutions of specific indices, especially for prevention, early diagnosis, and appropriate treatment of atherosclerotic cardiovascular disease assessment strategy, as shown in Figure 2.

An allostatic load score represents an interplay of different systems and clinical elements.[13] as shown in Table 1, which acts as an index to predict the escalating risk of incident

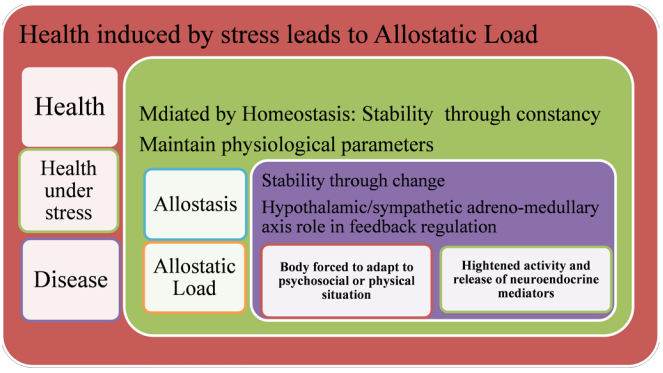

Figure 1: Stress action: Homeostasis vs. Allostasis
Source: Juster, McEwen &Lupien, 2010, McEwen in Logan and Barksdale, 2008 & Buckwalter *et al*., 2011

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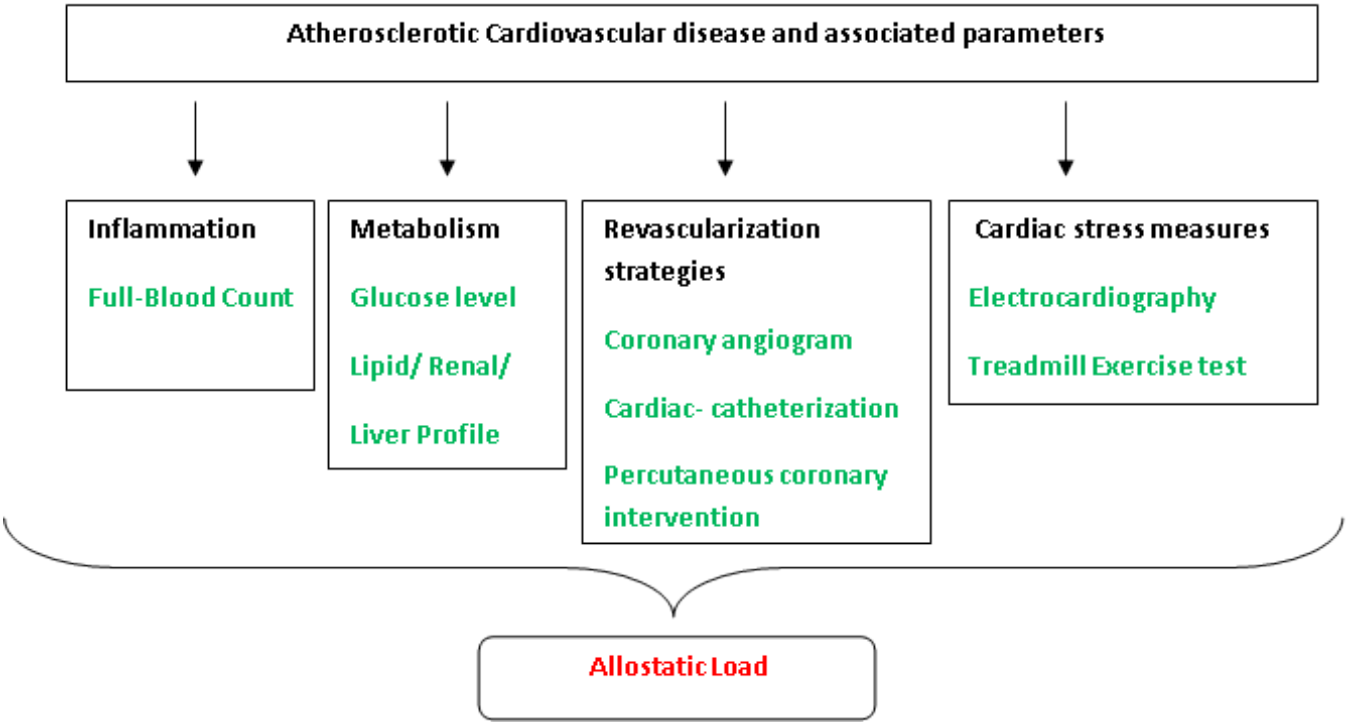

Figure 2: Atherosclerotic cardiovascular disease allostatic load design

cardiovascular disease and all-cause mortality.[6] In fact, calculating an allostatic load score is a quantifiable measure of the wear and tear, when multiple acute and/or chronic stress mediators are experienced.[6]And in analogous, allostatic load measure projects stress-related pathophysiological conditions which can be detected by evaluating an array of clinically associated metabolic factors[8] representing a cumulative measure[13] which can be established by considering various parameters as proposed in Figure 2.

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