Biomarkers for hardness-resilience: Psychological hardness is linked to baseline cholesterol measures in healthy adults

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Abstract

Many people Life and job stress leads to degraded health and performance for many people, but not all. Many show continued health and resilience despite stress. This study looks at psychological hardness and cholesterol markers in 56-52 healthy adult students at the National Defense University. Job, civil and military, all work to demanding national security occupations. This paper builds on and expands an earlier preliminary examination of this topic, providing more detailed findings on a larger sample. Results confirm that hardness (challenge) is positively associated with increased levels of high-density lipoprotein (good cholesterol), and negatively tied to cardiovascular risk (total cholesterol – HDL). While the basic mechanisms are still not clear, this study shows a definite link between psychological resilience (hardness) and underlying biochemical processes.

Hardiness and cholesterol

Cardiovascular disease remains the leading cause of death in the world (Bartone, 2005). Among the recognized risk factors for cardiovascular disease are psychosocial stress (NHLBI Working Group, 2004) and high cholesterol levels (Singh & Mori, 1992). While LDL- low density lipoprotein is generally seen as the culprit in coronary heart disease (CHD), more attention lately is going to the possible protective role of HDL – high density lipoprotein (Bartone, 2005). Type-A behavior is also an identified risk factor for CHD (Contrada, 1999). Contrada’s study was also one of few to examine the role of hardness in influencing cardiovascular responses to stress; he found hardness was associated with reduced (diastolic) blood pressure responsiveness to stress, while Type-A behavior style was linked to increased systolic and diastolic reactivity. Howard, Cunningham & Rechnitzer (1985) also found a link between Type-A pattern and elevated hypertension, and Hypertension moderated this effect. While these studies are suggestive of underlying biophysical processes associated with hardness, they are limited in their reliance on early, indirect measures of hardness. The lack of a good instrument to measure hardness may also account for the shortage of studies into the underlying biomarkers of hardness. The present study avoids this problem by using a proven, valid and reliable hardness measure, the DRS-15(r). Also, we examine hardness levels against a full lipid profile including HDL-high density lipoprotein. Theoretically, since HDL appears to function as a protective (resilience) factor at the biochemical level (Riddle, Stampfe & Rifkin, 2001), it may be associated with the hardy-resilient style in some way.

Methods

Students entering the National Defense University (senior service college) are offered free cholesterol screens, in addition to a range of other health services provided by the NDU Health and Fitness Center. In August 2008 and again in 2009, entering students who opted for cholesterol screens were also asked to complete the short hardiness measure – DRS-15 (see below description). A total of N=543 agreed to participate and permit access to their cholesterol lab results. Participants were approximately 70% military (all services) and 30% civilian workers, 22% women and 78% men. Average age was 44 years (s.d. = 4.5). Blood draw and lipid panels were performed by A&G HealthWatch LLC of Upper Marlboro, MD. After a 12 hour fast, blood was collected in SST (serum separator tubes) and, after a 20 minute wait to allow for clotting, specimens were centrifuged at 3400 RPM for 15 minutes at room temp. Total Cholesterol, HDL, LDL, and triglycerides were assayed on a Beckman CX7 analyzer. Using reagents from Beckman. Data were compiled and analyzed using SPSS. The relation of total hardness and its facets (commitment, control and challenge) to cholesterol levels was measured using Pearson correlations. Multiple regressions were also used to further test the effects of hardness and its facets on cholesterol factors.

Measuring hardness

The hardy-resilient style

Many studies have found that people high in hardness are more resistant to the ill-effects of extreme stress (e.g., Bartone, 1999). The hardy style person is also courageous in the face of new experiences as well as disappointments, and also leads to better cardiovascular functioning (Bartone, 2005). Type-A behavior is also associated with cardiovascular disease (Bartone, 1999). Despite considerable evidence for a health-protective function of the hardy-resilient style, few studies have explored the underlying biophysical processes involved. The present study examines possible links between hardness-resilience and some well-established biochemical indicators of cardiovascular health.

Results and Discussion

This is the first study to examine the hardy-resilient style against complete cholesterol levels, as part of a larger effort to determine the underlying biomarkers for resilient stress response patterns. Findings show that hardness is most strongly associated with HDL – high density lipoprotein. Logistic regression indicates that those in the high hardness group are over twice as likely to also have high levels of HDL – good cholesterol. This study appears that the resilience effects of the hardy-resilient style have a parallel at the level of blood lipid activity. More work is needed to clarify these effects and their relation to stress. It may be that the kinds of positive coping expectations and behaviors that high hardness people display have a direct effect on HDL production, which in turn serves to protect against cardiovascular disease by more efficiently disposing of excess lipids. Further analyses also need to address possible age and sex differences, as well as other factors known to influence cholesterol levels such as diet and exercise.

References


Correlations

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** Correlation is significant at the 0.01 level (2-tailed).