Resilient to Stress: Proposed a Novel Type E Personality

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Abstract
Stress responses vary with individual differences in sensitivity to stressful stimulus. Individuals with stress susceptibility personalities are facing an increased risk for developing various stress-related diseases. Epigenetic mechanisms, gene variants and personality are the key factors associated with individual differences. Although many studies have reported stress susceptible personalities and stress resilient personality, its underlying neural and hormonal mechanism have not been investigated yet. In this study we propose a new type E personality which turns stressful stimulus into eustress by positive perspectives. Type E personality, characterized by optimistic perspective, gratitude, charity work, social support, altruistic, religious activities and affective communication is closely associated with enhancing stress resilience through modulating immune, neuronal and endocrine systems.

Key Words: Stress response, Individual differences, Resilience, Type E personality

Introduction: Stress Vulnerability and Resilience

Stress response occurs to maintain homeostasis when the body encounters physiological or psychological stimulus. Consequences of these responses vary with individual differences in stress sensitivity. Individuals with higher susceptibility to stressful stimulus are at higher risk for developing stress-related mental diseases (Goh C et al. 2010, Wood SK et al. 2010). Resilience is defined as a process whereby people exposed to severe levels of stress or trauma are able to overcome and survive despite their difficulties. Stress resilience was inversely correlated with onset of cardiovascular disease and pain catastrophe (Ong AD et al. 2010, Crump C et al. 2016). Epigenetic mechanisms (Webster AL et al. 2013, Zovkic IB et al. 2013), gene variants (Derijk RH et al. 2008), and personality (Howard S et al. 2011, Kupper N et al. 2013) are the factors closely associated with individual differences.
Hyper-methylation in promoter regions of angiogenesis-converting enzyme, brain derived neurotrophic factor, catechol-O-methyl transferase (COMT) or Glucocorticoid receptor gene was found in patients with psychiatric disorders (McGowan PO et al. 2009, Zill P et al. 2012, Kang HJ et al. 2013, Norrholm SD et al. 2013). In animal studies, anxiety or depressive like behaviors and a concomitant increase in plasma corticosterone level were observed in stress susceptible (SS) group when compared to both normal and stress resilient animals. Hippocampal metabotropic glutamate receptor type 5 (mGluR 5) mRNA level was significantly lowered. Hyper-methylation in the exon of mGluR 5 was found in the SS group (Lee and Shim, Unpublished observation). Since mgluR 5 was reported to be involved in resilience to stress response (Shin S et al. 2015), epigenetic modification in the mGluR 5 exon may play an important role in depressive like behavior in the stress susceptible group. Several studies have reported that single-nucleotide polymorphisms in toloilid like 1, glutamate decarboxylase 1, neuropeptide Y, galanin receptor or oxytocin receptor gene were associated with mental disorders (Donner J et al. 2012, Xie P et al. 2013, Levran O et al. 2014). Abnormal stress adaptation responses such as excessive response, lack of adaptation, prolonged response, and inadequate response make up allostatic load (McEwen BS 1998). Several studies have reported that single-nucleotide polymorphisms in toloilid like 1, glutamate decarboxylase 1, neuropeptide Y, galanin receptor or oxytocin receptor gene were associated with mental disorders (Donner J et al. 2012, Xie P et al. 2013, Levran O et al. 2014). Abnormal stress adaptation responses such as excessive response, lack of adaptation, prolonged response, and inadequate response make up allostatic load which causes changes in body, in turn, leading to immune, metabolic, cardiovascular or neural diseases (McEwen BS 1998).

Individuals with type A personality, characterized by competitiveness and urgency, showed significantly high level of noradrenaline in response to stress (Polozhentsev SD et al. 1987) and reported to increase level of noradrenaline in response to stress (Polozhentsev SD et al. 1987, Sher L 2005, Conraads VM et al. 2006). Persistence of these hormones results in an increased inflammation and immune dysfunction leading to homeostatic imbalance and triggering several diseases. Individuals with optimistic perspectives cope well with stressful stimulus. Increased stress hormones are not prolonged by positive thinking-induced secretion of dopamine, endorphin, serotonin, and oxytocin; therefore, physiological balance can be maintained. Positive response to stressor, defined as eustress, can be implicated in stress resilient personality. Although many studies have reported stress susceptible personalities, stress resilient personality and its underlying neural and hormonal mechanism have not been investigated yet. In this study we propose a new type E personality which turns stressful stimulus into eustress by positive perspectives.

**Type E Personality**

It has been reported that positive affectivity and optimism are associated with recovery of stress-induced increased cortisol (Lai JC et al. 2005, Puig-Perez S et al. 2015) and diastolic blood pressure (Bostock S et al. 2011). Positive perspective in type E personality is different from optimism of personality type B. Type B individuals do not regard stressful stimulus as a stressor; therefore, an acute secretion of noradrenaline and cortisol for fight-or-flight response and cytokine-induced immune response do not occur. However, type E individuals immediately respond to stressor by the activation of amygdala and hypothalamic–pituitary gland-adrenal axis followed by a boost of energy. This acute physiological changes do not prolong due to positive affectivity-induced secretion of serotonin, dopamine and endorphin. Secretion of positive hormones is a key step of conversion from distress to eustress.

Attitude of gratitude is also a major feature of type E personality. It has been shown that higher expression of gratitude was correlated with reduced inflammation and increased parasympathetic responses (Mills PJ et al. 2015, Redwine LS et al. 2016). Parasympathetic activation is required to inhibit persistently increased release of stress hormones after stressful stimulus. Number of Met alleles in COMT gene, which is known as depression susceptible gene, was inversely correlated with tendency of gratitude (Liu J et al.
2017). Genetic variations in a gene affected oxytocin system were reported to be associated with expression of gratitude (Algoe SB et al. 2014). Dopamine encoded in COMT gene and oxytocin are key hormones for transition from distress to eustress.

As seen in "the Mother Teresa effect", charity work or religious spirituality or even watching someone else’s volunteer work serve as a protective factor in reducing stress, strengthening the immune system (McClelland DC 1989). It has been reported that volunteering has a positive effect on well-being resulting in a decreased symptom of depression (Thoits PA et al. 2001, Morrow-Howell N et al. 2003). Taken together, charity work can enhance body’s function to encounter stressful situation.

Social support can be defined as emotional, informative, or tangible assistance from family, friends, or companions. Individuals with supportive resources showed decreased cortisol reactivity which is accompanied by diminished activity of brain regions responsible for social separation (Eisenberger NI et al. 2007, Heaney JL et al. 2010). It has been reported that higher social support is closely related with higher level of salivary cortisol (Ditzen B et al. 2009).

Moreover, social support impacts on stress impact on mental illness at the level of the brain and what are the consequences? Peter Blumberg DB 2007: 198-202.

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