Guest Editorial

Resilience : an independent psychobiological mental health construct

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Survival against trauma is a unique characteristic of all human beings. While a number of factors contribute in building this capacity, resilience appears to be the most important one. Interest in studying resilience arises from number of areas which are of utmost clinical significance such as such as exploring the possibility of at-risk individuals who developing a mental illness;[1]. Resilience is a human capacity to adapt swiftly and successfully to stressful or traumatic events and revert back to a positive state. It is commonly conceptualized as the ability to thrive despite experiencing adversity [2-3].

Considering the contemporary evidence it is possible to argue that resilience is an independent psychobiological construct which mediates response to trauma. Some of the fundamental characteristics support its premise.1. Resilience is a specific and consistent feature. 2. It is shown to have specific neurobiology which supports its function. 3. Resilience has an important role to play in development of psychopathology of mental disorders.

RESILIENCE: A BASIC CHARACTERISTIC

Typically, resilience is not equivalent to coping. It has four different characteristics viz. Optimism, Adaptation, Satisfaction and Contentment. Resilience therefore remains involved in restoring the normal psychological state after coping with adverse life events. It is present across all ages and in all conditions, and influences response to trauma. Psychological and biological evidence suggest that resilience is involved in mediation of the process that leads to transition from health to illness. It is therefore a psychobiological construct which exists independently to play an important role in (1) maintaining psychological state which provides protection against adversities in both acute and chronic conditions. (2) Minimizing the extent of pathogenesis in developmental process of transition from health to disease (3) facilitating return to original stage once the adverse situation has changed.

Two fundamental questions arise in connection with resilience in health and disease. (1) Does it play a role in the process of pathogenesis, be it a mental disorder or physical disorder? If it is, then how? (2) If it is involved in changing healthy life to state of illness, can it be modified in a manner so that it can be used as therapeutic options?

Resilience is a protective factor against mental disorder and lack of resilience is a risk factor.
It has a close relationship with mental disorder and its pathogenesis; patients with low resilience have high prevalence of pathology. A number of traumatic events significantly decrease level of resilience and those with experience of early life trauma are subsequently more likely to develop psychiatric disorders like depression and suicide. Resilience has a specific neurobiology- people with an experience of trauma (supposedly a marker of diminished resilience) significantly differ from those who have not had such experience. This difference lies in both structural as well as functional characteristics.

Resilience is a modifiable construct, it can decrease as well as increase and therefore the risk of mental disorder can also decrease or increase. Further, the behavioural response being conditioned it can be correlated with neurobiological changes, e.g. size of amygdala, or function of neuronal circuits.

SPECIFIC NEUROBIOLOGY OF RESILIENCE

Current investigations are in the direction of exploring its role in treatment and prevention of mental disorders. Changes in neuroplasticity, HPA axis response to stress, neurotransmissions of dopamine, serotonin, and norepinephrine play an important role in maintaining homeostasis of resilience plasticity [5]. The central neurochemical response to trauma is HPA axis, which governs, coordinates and modulates various other changes arising from its interaction with HPT axis, CRH and CRF, to finally regulate neurotransmission mechanism. Neuroscience of resilience is beginning to uncover the circuits and molecules that protect against stress-related neuropsychiatric diseases. Glucocorticoids (GCs) are important regulators of basal and stress-related homeostasis and influence a wide array of genes. Recent work has provided novel pathways that can be influenced by early life stress, such as the glucocorticoid receptor. Cortisol, neuropeptide Y, dehydroepiandrosterone, adrenocorticotropic hormone and norepinephrine [6]. The serotonin transporter polymorphism short allele is a genetic risk factor associated with psychopathological response to stress, deregulated hypothalamic-pituitary-adrenal axis function, and lower levels of resilience [7-8]. Resilience moderates cortisol secretion in anticipation of the stressor. Brain responses to chronic social defeat and stress lead to suppression of hippocampal neurogenesis. Childhood abuse is associated with significantly increased risk of developing depression, schizophrenia and leading to increased vulnerability of suicide [9].

Research around gene environment integration offers a host of significant findings, which support the concept of resilience being an independent paradigm. Studies have shown that resilience is associated with increased connectivity between the ventral and dorsal prefrontal cortex. It has biological underpinnings, familial predisposition, and to some extent clear pathway as protective factors against a number of life events. Besides a number of other abnormalities in the brain have been observed e.g. Changes in neurocircuitry mediating reward, activation and regulation of mesolimbic dopaminergic projections from the Ventral Tegmental Area (VTA) to the nucleus accumbens (NC) [10].

Early traumatic experiences are linked to the development of mental disorders among individuals, more so among those who are vulnerable to mental illness. One common type of trauma that has been frequently studied is child sexual abuse. Many individuals who have experienced this type of trauma are found to be at increased risk for mental disorders such as anxiety and depression. Investigating mechanisms by which childhood trauma is associated with increased risk of mental illness would provide insight into processes involved in the emergence of mental disorders, as well as help with the identification of and development of treatment for predisposed individuals. There is a higher incidence of childhood adversities and sex abuse among those with severe mental illnesses such as schizophrenia, major depressive disorder, and bipolar disorder. The greater the severity and number of maltreatment incidents, the higher the risk for development of psychiatric morbidity. Clinical significance of research on resilience is around the area of prediction and prevention of mental disorders. Both clinical and animal studies are trying to explore the possibility of identifying candidates who may develop depression, PTSD or schizophrenia if they have faced adverse life situation. Relationship of stressful life events and psychiatric disorder is under investigation to find out if an individual will develop an illness and if so what treatment can either prevent or treat. Mostly, these clinical investigations are from the field of PTSD and depression research. Another important area of investigation is ultra high risk (UHR) conditions for psychosis. Studies around

UHR show that psychosocial functioning in UHR participants is often compromised; this dysfunction is often associated with negative symptoms, adaptive coping, and resilience. Interestingly baseline resilience is found to be lower among those in the UHR group who converted to frank psychosis than among those who did not. Treatment strategies for individuals at UHR for psychosis should be comprehensive, promoting resilience as well as targeting the reduction of positive and negative symptoms to foster social reintegration and recovery. Though it is not clear whether resilience is a modifiable or non-modifiable factor, studies report that resilience is affected by pharmacological interventions, e.g. Antidepressant drugs, such findings open newer areas of treatment of mental disorder. Understanding the psychology and neurobiology underlying resilience will help develop strategies aimed at preventing psychopathology after exposure to severe adversity. However individual differences exist, which determine the nature of psychopathology, response to treatment and outcome. Reason for such differences is complex which has been hampering the efforts to obtain best possible quality of life despite similar treatments and treatment settings.

Therapies can be developed for modifying resilience. In fact almost all treatments available to us can change resilience, the course and outcome of a mental disorder is almost parallel to the prevailing degree of resilience. A poorly progressing patient also has lower resilience. The main question arising is whether we can incorporate resilience in the system of pathology-vulnerability and develop this as a therapeutic means in health-psychology. This in a way will mediate illness to wellness. Research in the field of resilience has opened a new field of exploring complexity of response to trauma and maintenance of psychological state. Major implication expected is in development of newer therapies and prevention of mental disorders; however it's far away with current extent of our knowledge.

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