Neurobiology of Post-Traumatic Stress

Introduction
Post-Traumatic Stress Disorder is categorized as a Trauma- and Stressor-Related Disorder in the Diagnostic and Statistical Manual of Mental Disorders V (DSM-5). The disorder can only develop after an individual has experienced a traumatic stressor such as death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence. The exposure can be direct, experiencing the event first hand, or indirect, such as witnessing the event or through exposure to details of trauma often through professional duties.

Symptoms of Post-Traumatic Stress Disorder:
Individuals with PTSD will experience a combination of the following symptoms.
- Re-experiencing the traumatic event
  - Examples: nightmares, flashbacks
- Avoidance of trauma-related reminders
- Negative thoughts or feelings that began or worsened after the trauma
  - Examples: decreased interest in activities, self-blame, feelings of isolation


Neurobiology of Post-Traumatic Stress Disorder:
Studies have found increased levels of two catecholamines, Dopamine and Norepinephrine, in individuals with PTSD. These neurochemicals are responsible for the physiological effects including increased pulse and blood pressure, startle response, and overall levels of arousal.


Levels of serotonin, a neurochemical that helps to regulate mood, social behavior, appetite, sleep, and memory, are impacted in individuals diagnosed with PTSD. This impacts an individual’s capacity to reduce anxiety and contributes to increased vigilance, impulsivity, and intrusion of memories.


Some neurons, the cells responsible for receiving sensory input and sending motor commands to muscles, have been observed to have increased activity in individuals with PTSD. This increased activity contributes to the exaggerated stress responses, numbing, and dissociation behaviors.


Statistics:
- Approximately 70% of rape or sexual assault victims experience moderate to severe distress after the assault, this is a larger percentage than seen for victims of any other violent crime.
  Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, Socio-emotional Impact of Violent Crime (2014).

- The lifetime prevalence of PTSD for women who have been sexually assaulted is 50%, while that of the general population in North America is 7.8%.

- Almost one of every three rape victims develop PTSD sometime during their lives.

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