

# Post-traumatic Stress Disorder (PTSD) and Cerebellum

**Source: DTE** 

## Why in News?

A recent study found that individuals with <u>Post-traumatic Stress Disorder (PTSD)</u> may experience significant decreases in both **gray** and **white matter** volume in their **cerebellum**.

• This could affect their **cognitive functions** and **emotional responses**, among other aspects.

## What are the Findings of the Study?

- The study showed that PTSD is linked with considerable reductions in both gray and white matter volumes in the cerebellum.
- This reduction was particularly notable in specific subregions, including the posterior lobe, vermis, flocculonodular lobe and corpus medullare.
- The study also showed that cerebellar volume changes correlate with the intensity of the PTSD experience, offering a potential biomarker for assessing the condition's severity.
- It challenges the traditional understanding of PTSD as solely a disorder of the brain's emotion-processing centers.
  - The cerebellum's involvement suggests a more complex brain network disruption in PTSD, one that includes regions responsible for integrating cognitive and emotional responses.
- Study helps in understanding the pathophysiology of PTSD by pinpointing specific cerebellar regions affected by the disorder.

### What is Post-Traumatic Stress Disorder (PTSD)?

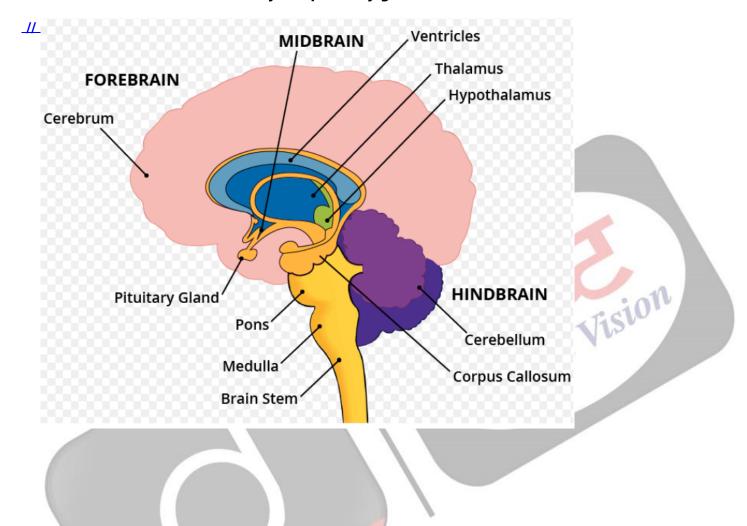
- Post-traumatic Stress Disorder (PTSD), is a mental health condition that occurs after a person experiences or witnesses a traumatic event, such as war, violence, abuse, or natural disaster.
  - People with PTSD may have intrusive memories, nightmares, flashbacks, avoidance and negative mood etc.
  - These symptoms can interfere with their daily functioning and quality of life.
  - PTSD can be treated with psychotherapy, medication, or both.
- PTSD is incredibly burdensome at both the individual and societal level, causing profound distress, functional impairment, and staggering treatment costs.

### What is Cerebellum and Other Parts of the Brain?

- The brain comprises three primary components: the cerebrum, cerebellum, and brainstem.
- **Cerebellum:** The **brain region** traditionally associated with **motor control**, but now increasingly recognised for its role in **higher cognitive** and **emotional functions**.
  - It is located at the back of the head, just below the cerebrum and behind the brain stem.
    Also called a "little brain" due to its similar but smaller structure than the cerebrum.
- Cerebrum: The largest part, consists of right and left hemispheres, playing a key role in

higher functions like interpreting sensory information, speech, reasoning, emotions, learning, and precise movement control.

- Brainstem: Functioning as a relay centre connecting the cerebrum, cerebellum, and spinal cord. It oversees automatic processes such as breathing, heart rate, sleep-wake cycles, digestion, and various reflex actions like sneezing, coughing, vomiting, and swallowing.
- Hypothalamus: Situated below the thalamus and regulates functions including body temperature, hunger, thirst, fatigue, sleep, and circadian rhythms. It is also involved in the release of hormones by the pituitary gland.



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