

# Posttraumatic stress disorder critical essay

[Health & Medicine](#), [Stress](#)



Any disastrous event in life can have serious impact on the mental condition of the victim. Posttraumatic stress disorder (PTSD) is an anxiety disorder that can result due to some tragedy in life of the patient such as “. . . combat, childhood physical and sexual abuse, motor vehicle accidents (MVAs), rape, and natural disasters”. People suffering from PTSD are extremely sensitive and may have to face many troubles. They may experience frequent recall of the painful events and become exceedingly defensive even in normal situations. The capability of the brain to identify an event being dangerous or not is hampered.

There are various organs involved in the process of identifying a frightful situation and actively responding to it. In patients suffering from PTSD this capability is not up to the mark and they behave excessively strained and cynical even in normal situations. Patients evoke their suffering memories recurrently. “ Insomnia, poor concentration, hypervigilance, and exaggerated startle response” are some of the conditions associated with the behavior of PTSD patients. They become over sensitive and susceptible in ordinary situations.

Another problem that people suffering from PTSD may have to face is poor memory that can be associated with smaller hippocampal values. Several studies have shown the relation between hippocampus and PTSD memory loss but a direct relation between the two hasn't been supported totally (Francati et al. , 2007). For determining the state of PTSD anxiety disorder, various functional neuroimaging techniques like SPECT, PET, and fMRI are used based on different parameters like cerebral blood flow, blood oxygen

levels, and energy consumption. SPECT is Single-Photon Emission Computed Tomography.

This technique uses rCBF and neuroreceptor concentrations to indicate state of different brain parts. SPECT is based on the use of “ $\gamma$ ” emitters to measure rCBF changes in the brain”. This imaging technique is simple and economical. The equipment and  $\gamma$  emitters used are easily available. On the other hand, SPECT has serious inaccuracy issues. Precision of results decreases when most inner sections of the brain are examined. Because only a single photon is used no positional information is obtainable. Use of nonspecific radionuclides and the injection of radioactive substance in the body make this technique fairly troublesome.

PET is Positron Emission Tomography and this technique makes use of two photons instead of a single one as used by SPECT. Therefore there is no lack of positional information and no need of a collimator. PET is easier to use. Signal changes are more traceable with it. However this technique is expensive and needs highly sophisticated equipment and operating staff. Functional Magnetic Resonance Imaging i. e. fMRI uses hemoglobin and strong magnetic field to produce images and does not involve a radioactive substance as used in other techniques.

fMRI does not involve the use of any radiation thus making it a safe choice over others. It provides high anatomical and spatial resolution. This technique is cheap and readily available. However, fMRI has low temporal resolution. The patient has to remove any metallic objects from the body before the scan and the equipment used for the scan is noisy. To measure PTSD the patient is subjected to traumatic stimuli and hence the reactions of

various parts of the brain to the stimuli are measured by various techniques as listed above (Francati et al. , 2007). Lanius et al.

(2005) conducted a study to assess interregional brain activity covariations during traumatic script-driven imagery in subjects with posttraumatic stress disorder (PTSD). For the analysis three groups of people were chosen: one group consisted of people that showed a dissociative response to the traumatic script-driven imagery, the other had a flashback response and the last one was group of trauma exposed control subjects without PTSD people. A 4-T whole-body magnetic resonance imaging (MRI) system was used to acquire the images and “ The script-driven imagery procedure was adapted to functional MRI (fMRI) .. . ”

As a result of the study, the first group with dissociative response gave the same disassociated reaction in the test. The other group of people that experienced flashback showed the same result in the test while for the last group the experience was like a normal memory recall. Functional connectivity patterns were different for the group that was disassociated and the control subjects with main concentration on the thalamus because of its direct association with the disassociation.

The non-PTSD control subjects showed left-hemispheric frontal activation while dissociated PTSD group showed right-hemispheric frontal and insula activation. The effects of remembering the traumatic event affect the patterns of activation in dissociated PTSD subjects. Insula affects the ability to interpret the signals for state of body and emotions such as pain, body temperature and all. The study showed the inability of the dissociative PTSD subjects to feel the emotions.

For the functional connectivity analysis between the dissociative PTSD subjects and the others with flashback an area in the right anterior cingulate gyrus was investigated. This area is responsible for emotion regulation. The study revealed greater covariation with the seed voxel in the right anterior cingulate for the flashback group, as compared to the dissociative group. Although the study conducted has revealed some interesting facts it has certain limitations as well. Functional connectivity analysis was not observed for all the three groups based on same region.

The size of the groups was very small for the study. People used in the study had some “. . . comorbid disorders, including dysthymia, lifetime history of polysubstance dependence, and majordepression”. For future studies it is suggested to have large sample size and studies should try to attend to covariations between clinical symptoms and brain activation patterns. Hopper et al. (2007) conducted a study to investigate the responses to script-driven trauma imagery in PTSD by employing the Responses to Script-Driven Imagery Scale (RSDI) and the corresponding neural activation.

For the study 27 individuals with PTSD were examined. A 4-Tesla whole-body MRI system was used to acquire the images. Responses can be of subtypes: reexperiencing, avoidance and dissociation. The study revealed that the state reexperiencing severity correlated positively with activity in the right anterior insula while it correlated negatively with activity in left rACC. These regions are associated with emotional regulations. However reexperiencing, avoidance and dissociation correlated negatively with activity in right IFC (region associated with movement inhibition).

All these findings support extreme emotional underengagement. The response states signify the emotion dysregulation in PTSD. The study has some limitations as well. The subjects were mainly women and the trauma was due to motor vehicle accidents, thus the results may not be applicable to a general class of PTSD subjects. The revealed correlations between the state dissociation and corresponding neural activation may not apply to high levels of disassociation. The examination is also not able to establish any direct relationships among the findings and every revealed result is connected.

In order to gain further insight into this matter further studies are recommended that may use the strong foundation of RSDI evident in this study but future improvements can be made by elevating the limitations. The article by Kolassa et al. (2007) aims at studying the slow waves generated in various parts of the brain of the people suffering from PTSD due to events like torture. Magnetoencephalography (MEG) was used in the study of waves. 194 subjects were investigated that involved 97 healthy controls and 97 patients.

Patients recorded enhanced abnormal slow wave activity in voxels in left temporal areas in the region of the insula and lesser slow wave activity in voxels in parieto-occipital areas as compared to healthier subjects. These findings imply abnormal performance in the left insula of PTSD. The right prefrontal cortex (PFC) and the left insula region are most subjected to stress. The insula plays a major role in attention, pain perception and emotion. It handles verbal, motor and musical information and performs visceral sensory and vestibular functions.

Irregularities in the functioning of insula may lead to troubles in verbal articulation and management of emotional states PTSD patients. PTSD may lead to emotions such as fear, anger and dysphoria in people. The results reveal PFC dysfunction that may lead to weakened disappearance of fear and sensitivity even in normal fearless situations. The study suggests that future research should concentrate on explaining and highlighting the role of the insula in PTSD and other neuropsychiatric disorders. Also differences in parieto-occipital delta dipole densities in PTSD subjects need focus in future.

However the present study is limited in its approach in clearing up the role of insula in PTSD disorder and PFC dysfunction. Both these are serious considerations and need detailed examination in future. Conclusion Posttraumatic stress disorder (PTSD) is an anxiety disorder resulting from any disastrous and shocking event in life. Hypersensitivity, fear, anxiety, anger, stress and loss of memory are the common symptoms associated with PTSD. Various functional neuroimaging techniques like SPECT, PET, and fMRI are used to monitor the state of brain.

Techniques like SPECT and PET rely on the use radiation while fMRI uses hemoglobin for the purpose of imaging. Various studies have been conducted to illustrate various parameters and situations associated with PTSD. A study by Lanius et al. revealed functional connectivity analysis during traumatic script-driven imagery in subjects with PTSD. The study showed the failure of the dissociated PTSD subjects to feel the emotions. Another study carried out by Hopper et al. considered the responses to script-driven trauma imagery in PTSD.

The results associated with different response states signify the emotion dysregulation involved with PTSD. Kolassa et al. focused on abnormal slow wave activity that may result in difficulty in verbal articulation and management of emotional states in PTSD patients. All the studies conducted had a common limitation of smaller sample size. The results of the investigations cannot be generalized for every traumatic situation and are limited in their approach. Further research is needed to highlight the role of individual regions of the brain in different PTSD severity levels.