

“The Perfect Storm in The Brain: The Clash of Brain Damage and PTSD”

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ABSTRACT

This article explores the concept of the “Perfect Storm” in the brain. The “Perfect Storm” in the brain occurs when a person is struggling with both physical damage to the brain and PTSD simultaneously. Through my clinical research project, “Listening to the Brain/Recovering the Brain/Mind,” I came to understand that all physical trauma to the brain is also traumatic to the individual and therefore a case of PTSD. Physical damage to the brain, including a TBI, stroke, seizures, infections, dementia, major mental illness and C-PTSD, causes the brain to “run” like a slow computer. This is extremely frustrating for the person because they then have a lot of difficulty processing their world both internally and externally. At the same time, PTSD causes the brain to speed up its functioning via stress hormones and the HPA axis. The result is “crazy making” for an individual, but this is seldom recognized. After laying out the theory, a case history is included that demonstrates how this issue develops and how it can be treated.

Keywords: TBI; PTSD; Concussions; Brain/Mind; Brain damage

Introduction

This article explores the concept of the “Perfect Storm” in the brain¹. Here physical damage to the brain clashes with psychological damage to the person’s sense of self. These are opposing processes because physical damage to the brain slows brain functioning. While at the same time an injury to the brain is always a traumatizing experience for an individual leading to PTSD, which speeds up processes in the brain/mind. These opposing energies clash leaving a person in a state of confusion, disorientation, frustration and dissociation often leading them down the path of suicidal ideation. Our brain/mind is how we interact with ourselves and how we process the world around us.

With this type of injury an individual has essentially lost themselves and this loss is subtle but very powerful. This is indeed, a very, very difficult situation for our patients. Unfortunately, this type of injury too often goes unrecognized and therefore untreated. This article is an attempt to shed light on this type of injury and suggest a direction for diagnosis and treatment. Lastly, I note that the “Perfect Storm” in the brain is represented as Architecture Four in the Complex Architecture Model I have developed (**Figure 1**)².

Let’s look at the details of the “perfect storm”

First, the physiological symptoms. The Concussion Legacy Foundation in Boston looks at the 4 Baskets of Symptoms

following a concussion and post-concussion syndrome. (3) I believe this paradigm is of great value when addressing all trauma to the brain. The 4 Baskets of Symptoms include:

- Physical Ailments
- Cognitive Decline
- Multiple Problems Dealing with the Person's emotional states and their social interactions
- Constant Sleep Disturbances

On my own, I have added the value of an Apple Watch (or the equivalent) App for sleep and dreams. Through this process of tracking nightly sleep and dreams, I have been able to learn a lot more about a person at a much deeper level. Amazingly, I have been able to predict major issues for the next day including seizures, blackouts, major depression and panic attacks. Quite fascinating and helpful!

Second, what is the psychological damage that leads a person to experience PTSD? When someone experiences a traumatic event, the mind responds by shifting into survival mode where brain chemistry is altered and the brain/mind begins to function differently. The immediate effects are confusion, disorientation, dissociation and increases in anxiety and depression. While the longer-term effects include flashbacks, avoidance and hypervigilance. The brain's fear circuits are activated, leading to physical and emotional changes in the brain/mind. And in addition, higher level functions like reasoning and emotional regulation lose their effectiveness in the person's life⁴.

The impact of trauma on an individual is serious business, but I don't believe it is taken seriously enough by medicine nor by our society. In my experience, trauma drives all forms of pain and suffering. Over time, trauma alters brain structures like the hippocampus and the PFC (pre-frontal cortex), impacts memory and emotional regulation and affects the individual's ability to feel safe in the world. Again, this is a "tall order" of problems impacting the individual's functionality on so many levels. And I believe we need to do a better job of recognizing and treating trauma whether it is coming from a psychological place, damage to the brain or both as is the case here.

Let's take a deeper look at the impact of trauma on an individual⁵. The immediate and short-term effects of trauma push the brain/mind into survival mode including:

- A state of shock and denial
- Emotional and physical dysregulation
- Hyperarousal of the nervous system
- Disorientation and confusion

The long-term responses of the mind involve:

- Intrusive thoughts and memories
- Avoidance of anything related to the traumatic event
- Increased hypervigilance
- Increasing difficulties with emotional regulation
- Significant changes in perception
- Concerns about a foreshortened future

As you can see from the above, there are significant changes in the neurobiology of the brain. Particularly with the fear circuitry in the brain, the PFC (prefrontal cortex), the hippocampus

and the makeup of the neurotransmitters in the brain. Overall, the brain/mind remains in a constant state of reactivity, rather than returning to a more restful, responsive state. In summary, traumatic events have the ability to physically alter brain functioning and structure in 3 major areas of the brain⁶.

The amygdala which triggers the fear response in the brain.

The PFC is responsible for decision making and emotional regulation. It can be either impaired or under active, making it difficult to control the brain's fear response and calm the body's stress response.

The hippocampus controls memory storage, works to distinguish past from present, creates fragmented memories under stress, will have difficulty discerning safety from past traumas and contributes to intrusive thoughts and flashbacks.

When I pull all this together, the "Perfect Storm" in the brain looks like this:

There are unwanted and repeated memories of a life-threatening event or events.

There are flashbacks where the event or events are re-lived and the person may lose touch with reality.

There is the avoidance of persons, places, things, sounds or sights that are reminders of past trauma.

Feelings of detachment from people, even family and emotional numbness.

Shame about what happened and what was done.

Survivors guilt with the loss of friends, family or comrades.

Constant hypervigilance and alertness for threats.

At the same time, the brain is physically injured and the normal processes in the brain/mind for repair, recovery and healing don't work well enough or even at all. Overall, the individual loses their normal functionality and they find themselves struggling to exist day to day.

Exploring a Case

How does this all get played out in a patient's life?

Ms. L grew up with an alcoholic mother who was physically and emotionally abusive from age 5 until she left home at age 19. Her mother's physical abuse included punching and slapping her daughter, which probably included at least some sub-concussive blows (which over time do cause significant problems just as "straight concussions do). At age 19 her car was broadsided by a driver who apparently did not see her and pulled onto the highway colliding with her car. Following the accident, Ms. L was hospitalized for over a week, going in and out of a coma. She did recover but with virtually no treatment or follow up for either the trauma and abuse or the severe concussion she had sustained. Here we have the evidence that this was already the "Perfect Storm" in the brain. Physical damage colliding with emotional damage.

From here she found a good paying job, got married and then divorced and held herself together through an eating disorder: bulimia. This is the way she managed her depression, anxiety and stress load. Eventually she got into psychiatric treatment and was on medication for over 12 years. The medication helped her cope by lowering her anxiety and keeping her relatively calm day in and day out. But the medication was not addressing her

PTSD, her TBI and the “Perfect Storm” in her brain. After 12 years of being on Tramadol and Prozac, she decided to get off the medication. Following this decision her symptoms exploded and emotionally out of control she came to see me.

By the time she had arrived in my office, she was experiencing the “Perfect Storm” in the brain with no understanding of exactly what this was all about. She was experiencing daily panic attacks that flooded her mind so she couldn’t concentrate on her life. She was depressed about everything. At the same time, she was also experiencing blackouts during which she temporarily lost consciousness and would find herself lying on the floor somewhere in her townhouse. On several occasions she blacked out while she was walking down the steps from her bedroom to the first floor. She could easily have broken her neck on one of these blackouts on the steps. Here again we see emotional damage (depression and panic attacks) clashing with physical damage. Where each set of symptoms magnifies the other set of symptoms. What is the way out here, the exit?

I have found that the treatment of the “Perfect Storm” requires addressing both sets of symptoms simultaneously. This is not easy work for the clinician because it involves being in “three places” at the same time, mind, brain and their continual interaction. With this challenge in mind, I set up the following treatment program for Ms. L⁷.

Nutrients for the brain, specifically to address damage to the mitochondria (the tiny energy factories in the nerve cells).

Stimulation to the brain on a daily basis. I suggest music with noise-cancelling headphones. A total immersion schedule for each day (like a full-time job).

Creating daily flow experiences⁸.

Neuro-Psychoanalytic sessions 2-3 times per week to process the recovery from the injury.

Weekly chiropractic treatment for the health of the nervous system.

Paying close attention to diet and exercise.

And most recently I have added the use of an Apple Watch with the sleep and dreams app (or an equivalent), to track the individual’s rhythm of sleep and dreams. Very, very helpful in tracking exactly where a patient is physiologically and psychologically.

In Summary

I have found that it is the healing relationship between doctor and patient, the matrix, the holding environment, that is the most powerful ingredient in the healing process. Because the patient is entering into a relationship where he or she is free to verbalize their experiences with someone who understands what they are going through. They are not waiting for something to be done to them; they are actively engaged in the healing process. Where they are encouraged to put their difficult, confusing, disorienting, dissociating, painful experiences into words. And over and over again, I have seen this process work to heal brain injuries (see “The Complex Architecture and Healing of Traumatic Brain Injuries” 2023). What I sense here is that it is the healing of the Self that is most crucial to the recovery process. My patients spend way more time talking about their personal lives and not that much time talking about their brain injuries. I did not expect this, but I see this process in every one of my patients. And over time they do get better! (See “The Complex Architecture and Healing of Traumatic Brain Injuries,” Cambridge Scholars Publishing 2023)⁹.

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