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The Brain/Mind Experience of Psychosis

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Introduction

I have never been a strong advocate of the use of psychotropic medications in the treatment of psychosis, especially when this is the exclusive treatment. At the same time, I am aware that these medications have helped many patients during their psychotic episodes, especially on a short-term basis. What I am questioning here is the best long-term basis for the treatment of psychosis. In considering this question I am reminded of Ms. B, a rather large and imposing woman, who would gallop (literary) around our hospital unit shouting "the Red Chinese are taking over Congress and we're all doomed" (who's to say that psychotic delusions don't have some truth to them). Her favourite quote as one of her galloping episodes would come to a halt was: "We're all going die!" It was rather comical to witness one of her episodes, but she was deadly serious and terrified at the same time. What I think is most important here is the fact that when I ran into her at another hospital about a year later, she was totally rational, literally a different person. Which leads me to ask the question: what exactly was the difference between her psychotic state and her non-psychotic state. And further, what is the experience of psychosis really all about? In consideration of the above, I would like to add one more thought. I recognize that anti-psychotic medications do help patients on their way to recovery. At the same time, I have come to the conclusion that the use of these medications also masks what happens to the brain as a result of struggling with psychotic experiences.

That in fact, psychosis is toxic to the brain [1]. And understanding this perspective, what do we do with it in terms of treating psychotic experiences? Below I present a case of a woman who had 3 previous psychotic episodes, eventually landing her in the criminal justice system by the time she began working with me. Her crime, arson. Placed on Haldol she did recover, but in sitting with her it was clear that her brain/mind was not functioning normally and was different from what she had been used to experiencing before her psychotic episodes. Again, if psychosis is toxic to the brain, then medicine needs to understand this to successfully treat psychosis [1]. And if we understand the experience of psychosis more completely, can we then design better treatment protocols for these patients beyond just psychotropic medications? I believe we can, specifically when we understand what is happening in the brain/mind during psychosis.

What then is Psychosis All About?

Psychosis is a serious mental and emotional breakdown. A state of mental and emotional confusion that creates enough chaos in the brain/mind that the individual is totally overwhelmed by it. Its most significant characteristic is the reduced ability or inability to distinguish between oneself and the reality around them. And equally important to understand, psychosis is a symptom of something else, not a standalone illness or disease. Challenges illicit a crisis for all of us, whether large or small. And depending on the intensity of the crisis and one's ability to tolerate their own individual vulnerabilities, the crisis is either contained through homeostatic functioning, or the crisis leads to some kind of disorder in mental and emotional functioning. In the case of psychosis, the crisis is a loss of the connection to the reality around them.

Some Perspectives to Work With

I will start by proposing that all psychotic experiences are not the same. They are all unique depending upon the individual, their biology and their psychology. And rather than assume psychosis is a single illness that can be treated with anti-psychotic medications, we need

to understand that psychosis is an individual response in the brain to being traumatized. These traumatic events can come from many places, and most probably occur at an early age. Which then leaves the individual vulnerable to future problems with any stressful event. Secondly, I am proposing that the human mind, what is so disturbed in psychosis, is the subjective experience of what is taking place in the brain. In other words, psychosis is a problem of how the brain is not functioning effectively. And we want to understand what has gone wrong in the brain that leads a person into these psychotic experiences? Note that I use the term brain/mind to refer to this perspective, that listening carefully to what our patients are telling us about their experiences is a direct connection to what is happening in their brain. Thirdly, what do we know about how an individual's brain/mind development can cause them to be vulnerable to a psychotic episode? New research points us in the direction of the following. Stress and trauma during childhood trigger the production of stress hormones in the body.

These stress hormones are secreted along the HPA (hypothalamus-pituitary-adrenal) axis and affect the production of neurotransmitters, particularly dopamine and glutamate. Persistent stress over time (usually from trauma) causes an overproduction of these neurotransmitters. What follows then is an overactive immune system that attacks these production sites for neurotransmitters. Over time, the production of these neurotransmitters becomes weakened and eventually destroyed leading to a psychotic episode. The collapse into a psychotic episode is often triggered by sensory impressions that are altered and/or amplified. Normal noise will often get louder, the room they are currently in will begin to feel smaller. Patients often describe these kinds of weird experiences, which originate through damage to the functioning of the neurotransmitters [2]. All our experiences are normally conducted through these communication networks in the brain at the level of our neurons. Is it any wonder then that when the production of neurotransmitters is weakened or destroyed, that a person would be experiencing something very weird and very strange (psychosis). Fourth, I believe the paradigm for psychosis is as follows: traumatic experiences lead to changes in the structure and functioning of the brain, which in turn leads to psychotic experiences.

Following this perspective I note the following quote: "These findings suggest that the extreme experiences of threat, hostility and violence in childhood and adolescence may mediate the development of psychotic symptoms in individuals with underlying genetic susceptibility and neuro-developmental adversity through cognitive processes (such as negative beliefs about the self, world and others, leading to distressing interpretations of everyday events or cognitive appraisal biases that could eventually result in paranoid delusions), affective pathways (such as anxiety, depression and emotional dysregulation, leading to dissociation that could eventually evoke hallucinations) and neurobiological systems implicated in psychotic disorder [2]. In other words, one of the serious end points of trauma (especially ongoing trauma) is psychosis. And if we understand that psychosis is a symptom of something else (trauma, drug use, and/or a medical condition), exactly how do we work with this?

The Description of Psychosis

Most patients don't experience psychosis as a sudden attack (like a heart attack or a stroke). Rather psychosis starts off as a set of subtle, innocent symptoms. These symptoms can include:

- A loss of contact with reality.
- Difficulties differentiating fantasy from reality.
- A loss of concentration.
- An inability to focus well.
- Difficulty absorbing and acquiring new knowledge.
- Disturbances in thought and memory.
- Difficulty explaining things.
- An increase in fear and anxiety.
- Disruptions with sleep and appetite.
- A slowing down of the energy needed to care for themselves.
- Withdrawal from social life and normal activities.
- A formal thought disorder (hallucination and/or delusions).
- Difficulties with speaking, understanding, reading, formulations of thought, and remembering things.
- Disorganized behaviour (a generalized slowing of their life, increased agitation, and strange behaviours).
- An increase in hostility, aggression, and hyperstimulation.
- Frequent mood swings (manic/depression).
- Locking oneself into their own world.
- Don't realize their contradictory emotions (sadness/happiness).
- Poverty of speech.
- Emotional indifference and feeling like a worthless burden.
- Indifference to one's surroundings and other people (can't observe, name, or experience other people).
- Lack of motivation and interest in their normal activities.

When we look at a list of the typical symptoms that come with psychosis, no wonder these persons have extreme difficulties functioning normally. Which again leads me to the question of what exactly is going on in the brain that certain individuals experience a psychotic episode?

Toward a More Effective Diagnosis of Psychosis

Recent research at NIMH, Research Doman Criteria (RDoC) gives us a different, and I believe more effective, way of diagnosing psychosis. This research begins with an understanding of the "dimension" of mental health. Their approach emphasizes a description of symptoms and personality over categories. Secondly, the dimension of mental health doesn't start with diagnosis, but rather begins by understanding the connections between neurobiology and behaviour and then link this to clinical phenomena. Thirdly, they are interested in defining the patient's constructions (their individual models) of fear, loss, perception, and cognition. Fourth, they emphasize considering the timing of treatment, by looking at the development of their disorder. And again, this is done vs. considering only the patient's diagnostic specificity. Overall, this is considering the person and the development of their disorder over labelling them with a diagnostic category [3]. In a separate article I have made the case for something very similar in terms of how we understand our patients. See "Thinking Differently: The Case for Symptomatology, Impairments, and a Healing Ecology" [4].

A Psychotic Experience

Introducing Ms.R. She began working with me 9 months earlier with the treatment goal of: "I want to stop these psychotic episodes, and I want to learn more about my alters." At the time she entered treatment she was serving time in a Mental Health Diversion Program for 2 years because of an episode of arson (one of three as she explained to me). She explained that she had started the fires (not the first time she had done this) during her third psychotic episode. (See the novel series "Moon Over Seaville" in 4 Episodes, the story of the hunt for a serial arsonist set in Southern California) [5]. She described her psychotic experience during that episode in the following manner:

- "I just felt so weird, and hard to be with."
- "Yes, I felt depersonalized, and I experienced a lot of derealization."
- "I felt fragmented and very tired most of the time."
- "It was like I was in some kind of primordial soup." (Very interesting comment above, which my patient could feel but not identify cognitively.)
- "Yes, I was dissociated most of the time."
- "I just couldn't be in my body."
- "I had a lot of sexual thoughts."
- "After sex, I just wanted to be loved, and I wasn't." Ms R also shared what I believe are some valuable insights about the experience of psychosis.
- "I think the brain has more new connections from experiencing delusions." (Does her comment confirm that psychosis actually changes the structure and functioning of the brain.)
- "I do miss drawing well. Psychosis and the medication took this away from me."
- "I also miss my alters. I just don't know how to reach them anymore. It seems like everything is worse for me when they're gone. They seem to hold those parts of me that are my motivation and my lust for life." (I see this comment as needing a whole separate article. What could be the relationship between psychosis and multiple personality disorder/dissociative identity disorder, if any?) "Sometimes they come out and there's like movement or expression that isn't mine, and that's it. Then they're just locked away from me." Considering the above, the experience of psychosis can be crazy making for the person and for those around them. Which then represents a significant challenge for treating clinicians.

The Treatment of Psychosis

Before I answer the question of recovering from psychosis, developing a treatment protocol, do we understand exactly what parts of the brain are most affected during a psychotic episode? And then how do we approach this? New research coming out of Stanford Medical focuses on 2 key areas of the brain that are malfunctioning during a psychotic break. One, the filter network which directs attention to external events and internal thoughts. Two, the predictor pathways which anticipate rewards. Dysfunction in either of these two systems leads to hallucinations and delusions making it very difficult for a person to distinguish what is real. Psychosis is really a symptom of dysfunction in the brain/mind rather than an illness itself. And can be triggered by mental illness, physical injury, substance abuse, external stress, trauma, or a chemical imbalance. These chemical imbalances are primarily an excess of dopamine receptor activity, or a decrease in glutamate receptor activity. Which is why psychotropic medications can be very helpful in the treatment of psychosis. Looking deeper into this complicated process in the brain/mind that damages the cognitive control systems in the brain creating a malfunction with reality, we find thoughts that are not linked to reality. These thoughts can capture the brain's cognitive control system, derailing the normal functioning of cognitive controls, and allowing intrusive thoughts to dominate. And this then culminates in the symptoms of psychosis [6].

Discussion

If we understand what psychosis is (again unique to each patient), as the loss of connection with the person's reality. And if we know that the stresses of pregnancy, early childhood, and later childhood affects the reactivity of the body's stress hormone axis (HPA axis). Which in turn affects the production of neurotransmitters in the brain. As we pay attention to the malfunctioning of the filter network and the

predictor pathways in the brain. And we listen to the patient's experience of psychosis. What kind of treatment models will help these patients recover from their psychotic episodes? To the above I would add our understanding that psychosis is toxic to the brain. I believe this presents a whole new perspective in working with psychotic patients. Note the following: (Schizophrenia) "It causes psychosis, which is an abnormal state of mind marked by hyperarousal, overactivation of brain circuits, and emotional distress. An untreated episode of psychosis can result in structural brain damage due to neurotoxicity. Patients who experience psychosis may be affected by inflammatory processes, oxidative and nitrosative reactions, mitochondrial dysfunction, decreased synaptic plasticity and neurogenesis, demyelination, and autoimmune attacks---all of which contribute to cell necrosis and irreversible neuronal atrophy [7]." In other words, psychosis can damage the brain.

In all my training in psychoanalysis and neuro-psychoanalysis, I had not seen this perspective until several months ago. Nor have I seen much dealing with the brain's role in creating psychotic experiences. But here it is, and how can we treat psychosis as a mind/brain problem rather than solely as a psychological issue, or medical issue? Here is another interaction with Ms. R, which I believe is very telling-about exactly what she is struggling with that is mind/brain. She was given the choice of a mental health diversion program over spending 2 years in jail for committing arson (while experiencing a psychotic episode).

- (P) "I hate my life, it's so lame!"
- (D) "What's making it so lame?"
- (P) "I have no motivation to do anything."
- (D) "Do you have anything that is meaningful in your life right now?"
- (P) "No! I'm bored all the time. I hate being alone, like I am here. And there are no answers for me."

A Long Pause

- (P) "I'm just going to have to accept my fate. There are no answers for me, and no one knows how to help me."
- (D) "I have been noticing that when you have a companion, you are able to go out and do things together, and this makes you very happy."
- (P) "That's true, but it doesn't happen that often. Only-once-in- a-while."
- (P) "And by the way, when I'm having psychosis, I have blurred vision.
- (D) "How long does this usually last? The blurred vision."
- (P) "When I'm in psychosis, I lose all track of time and place and I'm just wandering around in the world, aimless and clueless."
- (D) "Is it clear what finally ends your psychotic episodes?"
- (P) "I have no idea, and I'm at the point where I don't even care anymore."

Another Pause

- (P) "And by the way, I'm pretty sure I'm autistic along with everything that is happening to me."
- (D) "What makes you think that you are dealing with autism?"
- (P) "Because I get over-stimulated so easily."

Conclusion

I note that for Ms. R there are elements of both psychological processes (she is very depressed and feels hopeless) and biological processes (her vision was disturbed during her psychosis). Again, how do we work with this? I believe that working to understand psychotic experiences brings us into incredibly difficult territory. Being in psychosis is an overwhelming experience for the person, difficult to make sense of and difficult to move beyond. What starts these episodes and then what ends them? My own observations suggest that psychosis is a response/reaction to a brain/mind that is already defective and can't cope with or regulate strong emotions. And as suggested earlier, it is early life trauma that sets the individual's brain up for a psychotic experience/episode. Sadly, all of Ms. A's early life right up through high school was very traumatic, full of sexual and emotional abuse. And this sets the stage for her later psychotic breaks. By her own admission, her psychotic breaks all occurred following stressful life events. That is, when the brain/mind is pushed to its limits and it "cracks" (it stops functioning normally). In my experience, medication is not the sole answer, although it can be helpful along the way. What I believe is helpful is working within the context of the doctor-patient relationship. When patients are free to express everything, they are thinking and feeling, and that can be worked through, they get better 100% of the time.

And this is not easy, because the clinician is working not only with a very disturbed psychological condition, but damage to the normal functioning of the brain as well. Treatment needs to address both conditions, which is why I am an advocate of neuro-psychoanalytic treatment [8]. I conclude with an example of doctor-patient dialogue that addresses the complex nature of this kind of treatment. The major perspective here is the understanding that the human mind is the subjective experience of the brain. Then it is entirely possible to "listen to the brain" and help the brain/mind recover.

- (P) "I don't think any of our work together is helping me. I'm still stuck here, and I am bored all the time. Just on my phone checking out apps or staring at the blank walls around here."
- (D) "What were your expectations about our work together?"

- (P) "I don't know. I just want to feel better."
- (D) "What conclusion do you draw from the fact that you really had a great time at the Oddities and Curiosities Convention with your friend. And for several days afterward you were in very good spirits?" A long pause (when I believe her brain was thinking very slowly due to the damage of long-term childhood abuse and 3 psychotic episodes).
- (P) "Well, I've never liked being alone. I always need someone else with me."
- (D) "How does this help you?"
- (P) "I really don't know. I just need someone else to help me get motivated to do things."
- (D) Does this have anything to do with safety? Given all the abuse you have suffered from various people you have been close with; do you need to know that someone else is always there for you."
- (P) "I don't think it's that. I need someone else to motivate me. That's my real problem; I'm not motivated to do anything!"
- (D) "I find it interesting that there is important research identifying the brain structures that are responsible for creating motivation. And I'm taking an educated guess here that because of the extended childhood trauma you went through, and the 3 psychotic episodes, that this equals brain damage."
- (D) "So, I am recommending an fMRI that looks at the 10 Networks in the brain, because I believe damage to one or more of these important networks is responsible for part of the problem of no motivation."
- (D) "Then it gets even more complicated, because as you have already pointed out, when you have a good friend with you, the problems of motivation evaporate quite quickly. And this gets us into some very interesting questions of how adding other people's energy to yours makes a difference."
- (P) "I never thought about this way. But you're right, I do have more motivation when I know someone else is with me. It's not about having more energy or feeling safe in the world, because you have asked me about this, this is about not being motivated to do anything. Except, as you have pointed out, when I have a friend with me."

As I conclude this article, I am aware that there are many issues related to this case. Psychosis is complex and complicated and terribly confusing for the person experiencing it. If we tease out the specifics of each case, I believe the treatment course will be greatly improved. In this case, Ms. R's major complaint was a lack of motivation. Neuroscience has informed us that motivation has a driving force is deeply rooted in the intricate workings of the brain [9]. The structures involved include the Amygdala, which integrates emotions and behaviour. The Prefrontal Cortex plays a crucial role in setting and attaining goals, regulating emotional states, and boosting motivation. And the Striatum and Anterior Cingulate, which impacts the motivation and reward systems in the brain through influencing dopamine signalling [10,11]. And once again we come face to face with the amazing complexity and workings of the brain/mind. There is no simple structure in the brain that creates motivation. Or a single brain structure for depression or anxiety. These are complex systems and networks that create these important aspects of our being.

And when there are chemical disruptions in the brain caused by chronic trauma and psychosis (as is the case with Ms. R), this interferes with the brain's ability to accurately interpret inferences from the outside world (the major problem with psychosis). The good news: as we understand more about where the experience of psychosis comes from, the more effective we are in treating it.

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