

Schizophrenia and the effect on social cognition



Schizophrenia

Schizophrenia is a psychological disorder that is characterized by psychotic symptoms such as delusions and hallucinations. These symptoms can severely affect emotions, behavior, and most importantly, brain matter and processes (Seligman, Walker & Rosenhan, 2007).

Approximately 1% of the worldwide population has been diagnosed with schizophrenia, and approximately 1.2% of the United States population has been diagnosed, which is roughly 3.2 million individuals. About 100,000 individuals in the United States will be diagnosed with schizophrenia this year alone ("Schizophrenia Symptoms, Patterns and Statistics and Patterns", 2019).

Schizophrenia will typically occur within young adults in their late teens to late twenties. Although it is relatively rare, older adults and children can also develop this disorder. This condition can have a course of a lifetime and can affect social functions in regard to personal relationships, employment, and even basic self-care (Chu, Huang, Jian, Hsu & Cheng, 2016). Schizophrenia is one of the top 15 leading causes of disability worldwide, and individuals with schizophrenia have an increased risk of premature mortality. The estimated average potential amount of years lost for individuals with schizophrenia in the United States is 28.5 years ("Schizophrenia Symptoms, Patterns and Statistics and Patterns", 2019).

Symptoms

The criteria of symptoms falls into two categories, negative symptoms and positive symptoms. Negative symptoms include the absence or reduction of: brain matter and brain processes, emotions, emotional expressiveness, speech, and movement. Positive symptoms include hallucinations, delusions and disorganized speech or behavior. Hallucinations are defined to be sensations of perceived objects or events that are so vivid, they appear to be real. Delusions are defined to be false beliefs that are persistent despite lacking any form of evidence to be real. Abnormal psychomotor behavior includes catatonia in which is person will remain in an odd posture and rigid for hours. Some individuals with schizophrenia will display a diminished emotional expression, which is often referred to as a flat affect. Cognitive deficits include: difficulty in sustaining attention, diminished working memory, and difficulty with executive functions; such as the mental processes involved with planning, organizing, judgement, and problem solving (Seligman, Walker & Rosenhan, 2007).

Neuroscience of Schizophrenia

Structural studies have shown anatomical, volumetric and functional brain abnormalities and findings suggest that schizophrenia is a progressive brain disorder (Ren, Lui, Deng, Li, Li, Huang, Wang, Li, Sweeney & Gong, 2013). Volumetric studies have displayed reduced white matter in regions such as the frontal cortex, temporal cortex, and parietal cortex. Studies have also shown a reduction of gray matter in the thalamus, temporal cortex, frontal cortex, cingulate cortex, and insular cortex (Heuvel & Fornito, 2014).

In a meta-analysis of over 18, 000 subjects, researchers found a decrease of 2% in intracranial volume and brain volume of schizophrenia patients. A reduction in intracranial volume can suggest an early developmental cause of brain abnormalities considering that 90% of cranial volume is reached at 5 years of age (Haijma, Van Haren, Cahn, Koolschijn, Hulshoff Pol & Kahn, 2012).

When comparing medicated versus non-medicated schizophrenia patients, non-medicated patients displayed a more prominent volume reduction within the caudate nucleus and the thalamus. Both groups showed a similar amount of decreased white matter and non-medicated patients showed less widespread gray matter loss. Results of the study suggest that a reduction in brain matter can be related to a combination of early neurodevelopmental process abnormalities and progression of the illness (Egashira, Matsuo, Mihara, Nakano, Nakashima, Watanuki, Matsubara & Watanabe, 2014)

In a study comparing early onset schizophrenia and late onset schizophrenia, researchers used magnetic resonance imaging (MRI) to examine morphometric abnormalities. Patients with late-onset schizophrenia displayed a greater reduction in gray matter volume within the superior temporal gyrus, amygdala and hippocampus. An entire brain analysis revealed a significant difference in several regions of gray matter volume such as the: left precuneus, bilateral temporal poles, right insula, left superior temporal gyrus, and left orbitofrontal gyrus. Results suggested that reduction in gray matter can to be associated with the duration of illness, disorder severity and can even impair social cognition. (Zhang, Deng, Yao, Xiao, Li, Liu, Sweeney, Lui & Gong, 2015).

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Social Cognition

Social cognition focuses on how individuals process, store and apply given information within social interactions. Social cognition is involved in the way one perceives others and come to know the individuals surrounding them. The “ social brain” involves brain regions such as the: amygdala, prefrontal cortex, orbitofrontal cortex, paracingulate cortex, anterior cingulate cortex, temporal lobe, temporal-parietal junction and ventral striatum (Fujiwara, Yassin, & Murai 2014).

Schizophrenia and the Social Brain

Previous research has proposed that social cognition plays a major role in social functioning and has a distinct impairment in neurocognition. Non-verbal communication such as gestures, facial expressions, and eye-gaze are essential in everyday social interactions and recognition of basic emotion. Fujiwara, Yassin, and Murai have conducted multiple studies examining the social cognitive impairment in individuals with schizophrenia (Fujiwara, Yassin, & Murai 2014).

In an examination of how efficiently schizophrenia patients could recognize facial emotions and relation with the size of their amygdala, researchers found that amygdala volumes were significantly lower in schizophrenia patients compared to healthy subjects. Participants were assessed by using 39 photos expressing six common emotions. Schizophrenia patients scored significantly lower in the emotion recognition task, specifically in identifying the emotions of disgust, surprise, anger and sadness (Fujiwara, Yassin, & Murai 2014).

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In an examination of recognition of others' emotions, compared to controls, schizophrenia patients performed poorly on the Perception of Affect Task (PAT). Schizophrenia patients also had smaller gray matter volume in the left superior temporal gyrus, middle prefrontal cortex and right anterior cingulate cortex (Fujiwara, Yassin, & Murai 2014).

Alexithymia is a deficit in recognition of one's emotional state. In an investigation of gray matter difference and degree of alexithymia, the schizophrenic group displayed a correlation with alexithymia and left superior middle gyrus volume. The schizophrenia group also scored a significantly higher degree of alexithymia. The results suggested that people with this disorder tend to have impaired emotional self-awareness (Fujiwara, Yassin, & Murai 2014).

Theory of mind (ToM) refers to the ability to attribute to numerous mental states such as, beliefs, desires and emotions. It is established early in life, approximately by three to five years old. Individuals use theory of mind to understand that perspectives are different from one's own, and acknowledge others' emotions. It is crucial for everyday social interactions. A deficit in theory of mind is common in individuals with schizophrenia. The brain regions associated with theory of mind include the medial prefrontal cortex, temporal-parietal junction, and the orbital frontal cortex. In an examination of a deficit of ToM and an association of the superior temporal sulcus, participants were asked to complete a 'Reading the Mind in the Eyes' test. Participants were presented with photographs only displaying eyes and were asked to choose what given words best described what the person within the image was thinking or feeling. Schizophrenic patients performed poorly on <https://assignbuster.com/schizophrenia-and-the-effect-on-social-cognition/>

the ' Reading the Mind in the Eyes' test, and displayed a reduction of volume in the ventrolateral prefrontal cortex. Results suggested that the volume reduction within the prefrontal cortex could be an underlying factor in the deficit of ToM (Fujiwara, Yassin, & Murai 2014).

While Theory of Mind and empathy are similar, ToM refers to the ability to cognitively grasp the mental states of others while empathy is the ability to understand emotions. In an examination of empathy and the anterior cingulate cortex, researchers found that lower left dorsal anterior cingulate cortex volume was associated with lower perspective taking and empathic concern and a higher level of personal distress. The results of the study concluded that a reduction of volume within the anterior cingulate cortex may lead to empathic disabilities (Fujiwara, Yassin, & Murai 2014).

Numerous evidence has described the various deficits in social cognitive abilities in schizophrenia patients. There is a growing amount of literature detailing neuronal underpinnings of cognitive impairments (Fujiwara, Yassin, & Murai 2014). Brain abnormalities have established an impact within the severity of this disorder. The primary goal of schizophrenia research is to develop and provide treatments to help individuals with this debilitating disorder.

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