

ABSTRACT

Though the dysfunction of central dopamine system has been proposed, the pathogenesis of schizophrenia is still uncertain partly due to limited accessibility to dopamine receptor. Many studies in humans documented that appropriate stimulation of dopamine D1 receptors in the dorsolateral prefrontal cortex is critical for working memory processing, attention span, perseverance, planning, judgment, impulse control, organization, self-monitoring and supervision. It also is responsible for problem solving, critical thinking, forward thinking, learning from experiences and mistakes, ability to feel and express emotions, influences the limbic system, empathy and internal supervision . The dopamine hypothesis that occurs in patients with schizophrenia is a core feature of this illness.

Imagine for the moment that your daughter just left for college and you hear voices inside your head shouting, “You’ll never see her again, you have been a bad mother, she’ll die.” Or, what if you saw dinosaurs on the street and live animals in your refrigerator? These are actually experiences that have plagued Mrs. X for almost three decades. Mrs. X suffers the disorder known as schizophrenia. **Schizophrenia is an internal disease caused by fundamental organizational differences in the brain, and is triggered by drug use, stress, and one’s environment, thus making it difficult to diagnose.**

Dear Sirs:

Pertaining to our continuing failure to prosecute violations of minor’s rights to sovereign equality which are occurring in gestations being compromised by the ingestion of controlled substances,... the skewing of androgyny which continues in female juveniles even after separation from their mother’s has occurred, and as a means of promulflagitating my paying Governor Hickel of Alaska for my employees to have personal services endorsements and controlled substance endorsements,... the Iraqi oil being released by the United Nations being identified as Kurdistanian oil, and the July, 1991 issue of the Siberian Review spells President Eltsin’s name without a letter y. (Clarke-Stewart, B., & Wickens, R., p.514+515).

The disorganization and bizarre content of this letter suggests that its writer suffers from schizophrenia, a pattern of severely disturbed thinking, emotion, perception, and behavior that seriously impairs the ability to communicate and relate to others and disrupts most other aspects of daily functioning. Schizophrenia is one of the most severe

and disabling of all mental disorders. Its core symptoms are seen virtually everywhere in the world, occurring in about 1% of the population (Gottesman, 1991). There are three basic types of schizophrenia. One, Disorganized Schizophrenia (previously called “hebephrenic schizophrenia”) is the lack of emotion and disorganization in a person. Secondly, Catatonic Schizophrenia which gives a person waxy flexibility, reduced movement, rigid posture, sometimes too much movement. Lastly, Paranoid Schizophrenia, which the person receives strong delusions or hallucinations.

Mental illness—madness, if you will—has been with us throughout recorded history. The Old Testament warns those inclined to break the Ten Commandments that “the Lord will smite you with madness and blindness and confusion of mind.” The ancient Roman poet Horace (65- 8 B.C.) wrote of a man who each day took a seat in an empty theater and enjoyed a performance no one else could see or hear, roundly applauding actors who existed only in his mind.

Much later, the English playwright William Shakespeare(1564-1616) drew heavily on the theme of the deranged mind for dramatic impact in such classics as Macbeth, Hamlet, and King Lear.

Dr. Emil Kraepelin (1855-1926), a German psychiatrist, first described schizophrenia in a study. The term he coined for the condition he observed was dementia praecox, literally precocious (i.e. unusually early) mental deterioration. Kraepelin’s work was to serve as a basis for all future research into schizophrenia. His observations of patients suffering from dementia praecox formally identified for the first time many of the symptoms of schizophrenia and many of his diagnostic principles are still used by

psychiatrists today. His work stands as a landmark achievement in the field of psychiatric research.(Faraone, S. & Tsuang, M., p.7)

Kraepelin (www.pbs.org/wnet/brain/history/images/1896.jpg)

Kraepelin's work was to provide much of the base material and academic inspiration for the second great father of schizophrenia research, Dr. Eugene Bleuler (1857-1939). He created the term schizophrenia which literally means, "split mind" in 1911, when he was referring to the fragmenting of thought processes and emotions found in schizophrenic disorders.

As for the content of his research, it consisted in essence of extending Kraepelin's concept of the illness so that it included the main symptoms of dementia praecox together with those of paraphrenia a separate condition the latter had named to describe patients with delusions and hallucinations, but without other symptoms of dementia praecox. Bleuler listed the primary manifestations of schizophrenia as thought disorder, emotional blunting (that is to say an inability to experience normal emotions), and an impaired relationship with the external world. He considered thought disorder and emotional blunting, to be "fundamental" or "primary" symptoms of schizophrenia and delusions or hallucinations to be "accessory" or "secondary" to them. He examined his patients over a long period of time and concluded that, there were significant residual symptoms. We now know that this need not always be the case (Faraone, S. & Tsuang, M., p.7+8).

A lot of young people blame life at home with their parents as the cause of many problems or maladjustments of many kinds, including serious ones like schizophrenia. In some cases such an accusation may be reasonable in the future.

Can one's environment, or experiences, or family really cause schizophrenia? Does stress cause schizophrenia? Or does having the wrong genetic factors or chemistry in your cells allow stress to make a person a better target for schizophrenia? For now, the only possible answer is "perhaps." The effects of environment and family circumstances on the incidence of schizophrenia are being studied all the time. The answers to these questions may one day win the Nobel Prize in medicine for someone.

It is clear that studies have proven that schizophrenia is a brain disease. The functions of our minds and bodies depend upon the continuous action of electrical and chemical processes. The brain is part of the body's nervous system. It has billions of nerve fibers. When a stimulus—a noise or a light or smell, for example—acts upon a nerve ending at one of the sensory organs such as eyes, ears, or nose, the information is then carried as an electrical impulse, or signal, to the brain.

[The Brain \(www.vh.org/adult/provider/anatomy/BrainAnatomy/cover_art.jpg\)](http://www.vh.org/adult/provider/anatomy/BrainAnatomy/cover_art.jpg)

The nerve fiber connecting a big toe to the brain is not like a solid wire or a continuous piece of thread. There are spaces where nerve fibers meet others and signals

are passed from one to another on their way to the brain. These spaces, called synapses, are filled with tiny amounts of chemicals. For the electrical signal to jump across the spaces, perhaps switch to another track, and continue its journey to the brain, the chemicals must change from one side of the gap to the other.

The chemicals involved in such chemical processes are called neurotransmitters. The amount and type of chemicals at the synapses control the transmission of information. From extensive research, it is known that when those chemicals are not right, or get mixed up in some way, the transmission of signals goes haywire, affecting the way the brain reads the signals it receives. When a signal is scrambled because of chemical changes, the brain may interpret the information wrongly, perhaps even in an inappropriate or bizarre fashion. The reason these chemical changes occur is not known, but many scientists believe that these alterations of normal body chemistry produce the characteristic abnormal thinking and feelings of schizophrenia.

The pre frontal cortex is a part of the brain that allows us to make future plans and that is involved in such highly abstract areas as personal responsibility, and self control. This part of the brain goes through the most change. Teenagers face special risks like drugs and alcohol that can hijack the brain to the chaos of schizophrenia that often strikes in our adolescence years.

There are several different brain regions that are responsible for thinking, memory and emotions. The fact that so many regions have been malfunctioning has lead researchers to investigate a part of the brain which coordinates their operations.

At the beginning of adolescence the pre frontal cortex goes through a burst of growth. As neurons in a teenage brain reach out to connect to other neurons, much as

they do throughout childhood, they either grow stronger or they can wither away. The ones that stay are harder and robust.

“Psychosis,” a common condition in schizophrenia, is a state of mental impairment marked by hallucinations, which are disturbances of sensory perception, and/or delusions, which are false yet strongly held personal beliefs that result from an inability to separate real from unreal experiences (<http://www.nimh.nih.gov/publicat/schizoph.htm>).

In the normal brain, waves of sound falling on the ear, travel as electrical and chemical pulses to the hearing part of the brain, the auditory cortex. Generally signals travel to the thinking region of the brain. Scientists believe that in psychosis the thinking regions fail. Neurons misfire in random and chaotic ways, creating sounds that have no connection to the outside world. The result is that the perception of sound does not exist. Thus, people that have schizophrenia, hear abnormal, make believe people or voices.

Brain Scan of Schizophrenia patient (right) and normal brain (left). The normal brain shows more activity in the frontal cortex.

Researchers theorize that psychosis is caused in part by problems with a chemical in the brain called dopamine, one of the brain's neurotransmitters. Neurotransmitters are molecules that send messages from cell to cell across a tiny gap called the synapse.

Dopamine acts by stimulating receptors on the neuron as its target, setting off cascades of electrical and chemical reactions.

In the psychotic brain, the reasons that scientists still are trying to understand is why the levels of dopamine surge , overstimulating the receptors, and wreaking havoc with the brain's ability to send clear and accurate signals to cause hallucinations in people with schizophrenia. Dopamine in particular has long been suspected of playing a major role in schizophrenia (Huffman, K., Vernoy, M.,& Vernoy, J., p.493).

The second major theory for schizophrenia involves possible brain damage. The entire surface of central nervous system is bathed by a clear, colorless fluid called cerebrospinal fluid (CSF). The CSF is contained within a system of fluid- filled cavities called ventricles. The ventricles are shown in blue on the following midsagittal section of the brain (<http://faculty.washington.edu/chudler/vent.html>).

Researchers have found larger cerebral ventricles (cavities that contain cerebrospinal fluid) in some people with schizophrenia(Raz & Raz, p.93-108). Thus when these got larger something had to get smaller. Theories say that the pre frontal cortex, since it's in its growing stages, got smaller as the pressure from the ventricles got larger. Thus, this is why we see more adolescents developing schizophrenia.

The Brain (<http://faculty.washington.edu/chudler/vent.gif>)

Anti-psychotic medications relieve psychosis by reducing the impact of dopamine on the neurons. By clogging dopamine sensitive specters with diminished neuron stimulation, psychotic systems usually lessen and often disappear.

As the turn of the century has dawned, researchers are looking more into the possible causes of schizophrenia, and ways to successfully treat people with it. The outlook for people with schizophrenia has improved over the last 25 years. Although no totally effective therapy has yet been devised, it is important to remember that many people with the illness improve enough to lead independent, satisfying lives. As we learn more about the causes and treatments of schizophrenia, we should be able to help more patients achieve successful outcomes. Once a man said, “These days people seek knowledge, not wisdom. Knowledge is of the past, wisdom is of the future.” Let’s look ahead and find a cure for schizophrenia.

References

- Abramovitz, M. (2002). Schizophrenia. San Diego: Lucent Books, Inc.
- Canada, Health. (1991). Schizophrenia: A Handbook for Families. Minister of Supply and Services Canada.
- Clarke-Stewart, B. & Wickens, R. (1997). Psychology. (4th ed.). Houghton Mifflin Company.
- Faraone, S.V. & Tsuang, M.T. (1997). Schizophrenia: The Facts. Oxford Press.
- Huffman, K., & Vernoy, M & J. (1997). Psychology In Action. (4th ed.). John Wiley & Sons, Inc.
- PBS Home Video (David Grubin). (2001). The Secret Life of the Brain: The Teenage Brain: A World of Their Own. [Videotape]. New York: PBS.
- Saskatchewan, Schizophrenia Society Of. (1997). Schizophrenia: The Great Disabler of Young People.
- Smith, D. W. (1993). Schizophrenia. Venture.
- Young, P. (1988). Schizophrenia. Chelsea House Publishers.
- <http://dictionary.reference.com/search?q=psychosis>
- <http://www.encyclopedia.com/html/s1/schizosph.asp>
- <http://faculty.washington.edu/chulder/vent.gif>
- <http://www.fmhsussex.co.uk/schizo.htm>
- <http://www.nimh.nih.gov/publicat/schizosph.htm>
- <http://www.pos-ed.org/medications.jpg>
- <http://www.pbs.org/wnet/brain/images/header.jpg>

<http://www.pbs.org/wnet/brain/history/images/1896.jpg>

<http://salmon.psy.plym.ac.uk/year1/schizophrenia.htm#AIP>

http://www.vh.org/adult/provider/anatomy/BrainAnatomy/cover_art.jpg