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AN OVERVIEW OF SCHIZOPHRENIA-A MENTAL DISEASE

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ABSTRACT
It is a mental disorder. Mainly in men, the symptoms appear between 18 and 25 years of age, while in women, symptoms appearance has two peaks 25–30 years and after 40 years. All the symptoms of schizophrenia are divided into three separate categories positive, negative, cognitive symptoms. Genetic and environmental factors are considered as the major factors that can stimulate the development of schizophrenia. These studies have shown a decrease in gray matter, enlargement of ventricles, and focal alteration of white matter tracts. Schizophrenia brain is characterized by reduced volume of temporal cortex that is associated with schizophrenia psychopathology. There are two types of treatment that are available to the patients suffering from schizophrenia, use of medications, psychotherapy.

KEYWORDS: Etiology, Symptoms, Pathophysiology, Treatment, Prevention.

❖ INTRODUCTION

Schizophrenia is still one of the most mysterious mental disorders that are characterized by delusions, hallucinations, and impaired social behavior. Schizophrenia is a complex, chronic mental health disorder characterized by an array of symptoms. There are various factors that can be a cause or a risk factor for creating this disorder; some preventable and some non-preventable. Schizophrenia is a debilitating illness that affects up to 1% of the population around the world. People with schizophrenia may also see, smell, taste, and feel things that are not there. Disorganized speech is when the individual speaks in ways that are hard to understand or uses sentences that might not make sense. Sometimes the speech is completely incomprehensible. Schizophrenia is a severe mental disorder characterized by emotional blunting, intellectual deterioration, social isolation, disorganized speech, behavior delusions, and hallucinations. The symptoms must be present during a 1-month period.

Schizophrenia is a severe psychiatric disorder, a heterogeneous behavioral and cognitive syndrome that is related to the disruption of brain development caused by genetic or environmental factors. Sweden psychiatrist Eugen Bleuler introduced the term schizophrenia in 1908.

❖ Symptoms

Studies show that incidence rate is higher for men than for women based on the negative symptoms and long duration of illness demonstrating that schizophrenia symptoms are more severe in men than in women.

Furthermore, in men, the symptoms appear between 18 and 25 years of age, while in women, symptoms appearance has two peaks 25–30 years and after 40 years.

All the symptoms of schizophrenia are divided into three separate categories

Positive symptoms | negative symptoms | cognitive symptoms

Positive symptoms
The scale for the assessment of positive symptoms describes five groups of positive symptoms Delusions, hallucinations, thought disorder, bizarre behavior, inappropriate affect.

Negative symptoms
Negative symptoms can occur in patients with other neurodegenerative disorders: Parkinson's disease, Alzheimer's disease, or severe depression. These symptoms are evaluated by the scale for the assessment of negative symptoms include blunted effect, a logia, Avolution, asociality.The negative symptoms occur in 50–90% of patients at the onset while treatment reduces the prevalence of negative symptoms to 35–70%.

Cognitive symptoms
Cognitive impairments include different types of memory. memory like working memory, long-term, verbal declarative, and episodic memory,attention, and learning. Cognitive dysfunctions can be present before the appearance of schizophrenia in adolescence or early childhood.

Patients with schizophrenia possess difficulties with paying attention and focusing and understanding the information. s. At early stages of schizophrenia development, persons become asocial, unmotivated, emotionless, and depressive.

❖ **Etilogy**
Genetic and environmental factors are considered as the major factors that can stimulate the development of schizophrenia.

Genetics
Genetic factors include changes of the genetic material at different levels starting with gene sequence and finishing with genomic abnormalities.

A child who has a biological parent that has been diagnosed with schizophrenia has approximately a one in eight chance of developing this dreaded disorder.

In case of monozygotic twins, the possibility of one twin suffering from schizophrenia is as high as 48%. among dizygotic twins the risk is 12% - 14% of schizophrenia. In case of both parents having schizophrenia, the possibility that their child will suffer from schizophrenia is around 40%.

While there is a considerable drop, these rates are still considerably higher that a 1% rate which is found in the general population patients with schizophrenia possess de novo mutations in the number of putative genes including dihydropyrimidine dehydrogenase, laminin, α2, transformation/transcription domain-associated protein, and vacuolar protein sorting 39.

Genetic predisposition, brain abnormalities, prenatal and perinatal have been discussed as an array of contributing causes.

Prenatal and perinatal complications have a strong effect and increase the risk of schizophrenia from 1 in 100 to 2–4 in 100 individuals.

Abnormal immune response in maternal organism correlates with the development of schizophrenia in children.

Environmental factors
Environmental factors including infections, stress during gestation, or childhood play an important role in the development of schizophrenia symptoms.

Individuals with schizophrenia also are surrounded by socioeconomic environment, belong to urban population or represent members of the immigrant population.

Males with schizophrenia are considered to have more severe manifestation of disorder, earlier onset, lower response to treatment, and less favorable outcome. These features may be related to the physiological and hormonal differences in women and men.

Overall, the etiology of schizophrenia is based on the genetic vulnerability and environmental factors, which interact with each other affecting development, maturation, and plasticity of the brain.

❖ **Pathophysiology**
Pathophysiological changes can be easily observed using modern neuroimaging techniques
These studies have shown a decrease in gray matter, enlargement of ventricles, and focal alteration of white matter tracts. Schizophrenia brain is characterized by reduced volume of temporal cortex that is associated with schizophrenia psychopathology.

Some nuclei in the thalamus including pulvinar and medial dorsal nuclei that are associated with respective cortical regions are reduced. The thalamus plays an important role in the integration between the cortex, the cerebellum, and incoming sensory information. Other brain structures, including corpus callosum, cerebellum, and striatum, also demonstrate abnormalities in schizophrenia brain. Impairment of several regions in the brain that forms a functional network, cause the psychopathological difficulties in schizophrenia patients. Diffusion tensor imaging investigations show disorganization of white matter in several brain regions including prefrontal and temporal white matter, corpus callosum, and uncinate fasciculus. PET scanning demonstrates decreased levels of blood flow in the left par-hippocampal region, reduced glucose metabolism in the thalamus, and frontal cortex. These techniques also show an association between delusions and hallucinations and decreased blood flow in the cingulate,

left frontal, and temporal areas. In contrast, patients with active auditory hallucinations are characterized by increased blood flow in thalamus, hippocampus, striatum, orbitofrontal, and cingulate areas.

Previous pharmacological studies and observations suggested the "dopamine hypothesis" for schizophrenia development. The action of antipsychotics helped to identify that D2-dopamine receptors blockade has a positive effect on the symptoms. Furthermore, such drugs as amphetamine that stimulates the action of dopamine cause psychotic symptoms in normal individuals. Further, studies have confirmed that dopamine modulates cognitive function in the prefrontal cortex that is in line with the schizophrenia disorder. Neurochemical imaging with the use of radioligands 18F-dopa and 11C-raclopride have demonstrated increase synthesis, accumulation, and release of dopamine during the psychotic symptoms of schizophrenia. Functional MRI has shown abnormalities in the brain structures and hyperactivity or hypoactivity of their functions. Other studies demonstrate the role of glutamate in schizophrenia. Some agonists of glutamatergic NMDAR including ketamine can cause psychotic symptoms and cognitive abnormalities.

Furthermore, it was noticed that patients with schizophrenia are highly sensitive to psychotomimetic drugs. The hypo-activity of NMDAR may be another reason for pathophysiology of schizophrenia. substances (D-serine and sarcosine) that modulate NMDAR have positive effect on the reduction of negative symptoms. Reduce activity of NMDAR may cause the cortical atrophy and loss of dendritic spines observed in schizophrenia. Some other neuropathological studies demonstrate that gammaaminobutyric acid (GABA) may have a potential role in the pathogenesis of schizophrenia. Reduced BDNF signaling or decreased NMDAR activity may reduce levels of GABA interneurons. These abnormalities can cause abnormalities in the dorsolateral prefrontal cortex affecting cognitive functions including working memory in schizophrenia patients. Loss of neurons in prefrontal cortex, anterior cingulate cortex, and hippocampus, as well as reduced number of glial cells and decreased neuronal density, can be associated with the active apoptotic processes in the schizophrenia brain. levels of anti-apoptotic protein Bcl-2 are reduced by approximately 25% in the middle temporal cortex in patients with schizophrenia. increases apoptotic processes is oxidative stress. Reduced blood markers of antioxidant enzymes and increased turnover of phospholipids demonstrate increased levels of oxidative stress in schizophrenia patients. Reduced activity of NMDAR, high calcium levels, mitochondrial impairments, oxidative stress, and glutamate excitotoxicity stimulate apoptosis of neuronal and glial cells that are widely observed in patients with schizophrenia.

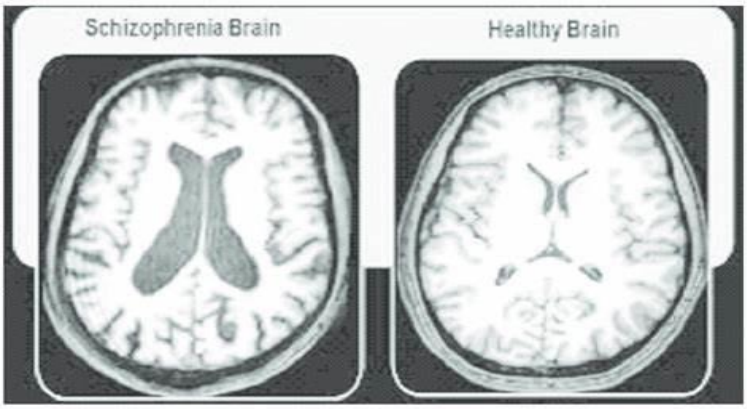

Fig. 1: Brain Condition.

❖ Risk factors associated with Schizophrenia

The risk factors associated with Schizophrenia disorder is age. Schizophrenia disease can affect a person at any age, this disorder mainly tends to occur during the adolescence or young adulthood stage. Schizophrenia is also associated with gender. Schizophrenia can affect both women and men but in men this condition is likely to occur at the age of 15 to 24 years (Horn, 2009). In women, this condition tends to occur at the age of 25 to 34 years and the symptoms in this case are not as severe as in men. Another risk factor is intelligence; people with schizophrenia exhibit a full range of intelligence. . Epilepsy and other psychotic conditions also increase the risk of developing schizophrenia.

❖ Treatment

Types of treatment available for schizophrenia

There are two types of treatment that are available to the patients suffering from schizophrenia.

a) Use of medications.
b) Psychotherapy.

a) Use of medications

Antipsychotic medications are used to normalize the biochemical imbalances that mainly cause schizophrenia. Examples of antipsychotic drugs include chlorpromazine, fluphenazine and haloperidol (Deyar, 2008).

Use of medical drugs that reduce the expression of major symptoms of schizophrenia. The first-line treatment agents are antipsychotic agents. There are over 60 antipsychotic drugs that have been developed to use in schizophrenia treatment for reducing the positive symptoms expression.

The drugs are classified into two groups
a) First generation agents.
b) Second-generation agents.

a) First generation agents
These agents include chlorpromazine, fluphenazine, and haloperidol. The first-generation agents are effective in reducing the psychotic symptoms though they can lead to motor side effects.

b) Second-generation agents
The second-generation agents including olanzapine, risperidone, and quetiapine mostly do not cause the development of motor side effects.

b) Psychotherapy
This kind of treatment involves educating, advising, reassuring, modeling and reality testing with the therapist (Hoyle, 2011).

Psychotherapy is not the best form of treatment for the patients with schizophrenia. This form of treatment can, however, be used as a way of supporting the patient who is on medication.

❖ PREVENTION

Presevation of schizophrenia is difficult due to heterogeneity of symptoms and causes of the disorder. Psychotic disorders occur in young people disrupting educational and social contacts that is why it is important to prevent the development of schizophrenia. Several studies demonstrate that mild psychotic symptoms including hallucinations and delusional thinking might precede the diagnosis of schizophrenia. It is important to detect individuals with high risk of the mental disorders development.

❖ CONCLUSIONS

Schizophrenia is a severe psychiatric disorder that is related to the disruption of brain development caused by genetic or environmental factors. The prevalence of schizophrenia is approximately 1% of human population. Management of the disorder includes medications, social training, cognitive behavioral therapy, and other approaches. There are approximately 60 different antipsychotic medications that inhibit positive, negative, and cognitive symptoms.

Although in the 100 years scientists have described possible causes, mechanisms and treatment strategies of schizophrenia, most of the patients remain chronic ill requiring additional social help, physical support, and understanding.

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