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Pathophysiology of Schizophrenia

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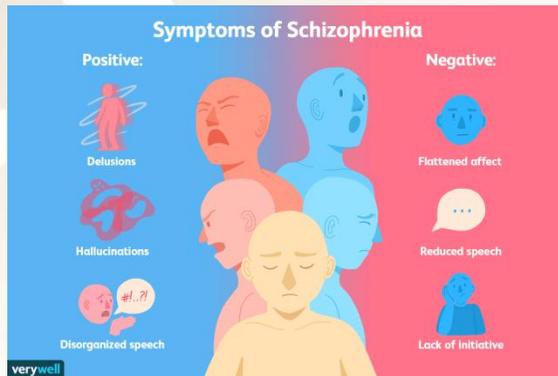
Introduction

- The topic selection for the poster assignment is 'Schizophrenia'
- The rationale for selecting this topic is to understand the pathophysiology of the condition as well as the clinical significance of the condition.
- Schizophrenia is clinically referred to as mental health (psychiatric) disorder, which can be neurological and heterogeneously genetic.
- Schizophrenia is a condition that is not well known and there are misconceptions in the community about the condition.
- I believe by understanding its etiology, pathophysiology, and presenting signs and symptoms; I will be able to give the best nursing care to my patients.

Signs and Symptoms of Schizophrenia

Signs and Symptoms

- The patient exhibits delusions. For example, they may think they are being harmed or harassed.
- Patient experience hallucinations by seeing or hearing things that are not in existent.
- Patient exhibit disorganized thinking or speech.
- Patients are extremely disorganized behaviors
- Show negative symptoms or inability to function normally.



Diagnosis

DSM Criteria for Schizophrenia

DSM outlines the following Criteria:

- Two or more of the following conditions for at least a month:
 - Delusions
 - Hallucinations
 - Disorganized speech
 - Grossly disorganized or catatonic behavior
 - Negative symptoms, such as diminished emotional expression

Etiology

- The exact cause of the condition is not well know but physical, genetic, psychological and environmental factors play a role.

Pathophysiology of Schizophrenia

The underlying pathophysiology of schizophrenia involves dysregulation of different pathways in the brain function. The pathway involves abnormalities in neurotransmission with either excess or deficiency in neurotransmissions (Uher et al., 2019). There are three main theories that explain the pathophysiology including dopamine, serotonin, and glutamate.

Position Emission Tomography (PET) studies shows evidence of dopaminergic hyperactivity in nucleus accumben and in the dopaminergic hypofunction in frontal temporal regions

In the dopamine theory, the main culprit is dopamine, although other neurotransmitters like glutamate, aspartate, glycine, and GABA (gamma-aminobutyric acid) are also implicated (Uher et al., 2019; van Santvoort et al., 2015). As in many other brain disorders, schizophrenia is associated with abnormal activities at the dopamine receptor site, mainly D2 (Sandstrom et al., 2020). Evidence shows increased density of D2 receptors in nucleus accumbens which leads to positive symptoms. Evidence also shows decreased densities of D1 receptors in prefrontal cortex which leads to negative activities. Four major pathways that are involved include dopaminergic pathways, mesolimbic pathway, mesocortical pathway, and the tuberoinfundibular pathway.

Dopamine Tract	Origin	Innervation	Function
Nigrostriatal	Substantia nigra	Striatum	Movement
Mesolimbic	Ventral tragmentum (area of mid brain)	Nucleus Accumbens and Amyglada (area of lymbic system)	Arousal, stimulus processing, motivational behavior
Mesocortical	Ventral tragmentum	Frontal and Prefrontal Lobe Cortex	Cognition, communication, social function, response to stress
Tuberohypophyseal or Tuberinfundibular	Hypothalamus	Pituitary gland	Inhibit prolactin release

Other theories

The serotonin theory is based on the activities of lysergic acid diethylamide (LSD) that enhances the effect of serotonin on the brain hence the effect is on serotonin receptors (Sandstrom et al., 2020).

The glutamate theory is based on excitatory neurotransmitter through the action of phenylclidine and ketamine, both glutamate antagonists (Sandstrom et al., 2020).

Significance of Pathophysiology

According to WHO, the condition affects 20 million people worldwide. The condition is associated with a considerable disability and it is likely to affected educational and work outcomes.

Schizophrenia is one of the misunderstood condition. It is a condition that is surrounded by various myths and misdiagnosis. About half patients referred to specialized care with diagnosed schizophrenia do not have it (Coulter et al., 2019). Shen et al. (2018) found a 70.6% prevalence of misdiagnosis for patients with depression.

Due to the misunderstanding and misdiagnosis, people with schizophrenia do not receive the most appropriate care and this affects their life, work, and educational outcome (WHO).

In addition, the condition is also associated with some spirituality and this leads to a lot of stigma. In some communities, people with schizophrenia are thought to be possessed by evil spirits and are restrained by locking them away from the public.

WHO estimates that 69% of people with schizophrenia do not receive appropriate care because the etiology is not well known. Also, most people with the condition are less likely to seek healthcare services.

People with Schizophrenia are two to three times likely to die earlier compared to the general population due to preventable disease like heart diseases, infections, metabolic diseases, and others. (WHO)

Therefore, understanding the pathophysiology has a number of significances.

One, it helps to gain an insight and important knowledge about how the condition affects the body and how it develops with time.

Two, it provides the basis for developing appropriate medication that targets the exact part of the brain or a step in its etiology.

Three, it provides information that helps in formulation of the best nursing care plan and interventions for the patients.

Implications for Nursing Care

Implications of for nursing care is that nurses must engage in developing trust and communication with such patients and they must also develop a maintenance treatment plan with psychotic medications as well as psychosocial therapy. Effective collaboration with other multi-disciplinary personnel is highly encouraged among the nurses for providing quality treatment and facilitating collaborative or shared decision-making processes among the team of nurses to ensure patient's safety and improved health conditions. Nursing intervention on such patients could include psychosocial interventions such as illness self-management, social skills training (SST), case management/assertive community treatment (ACT), family psychoeducation, and supported employment interventions, which can help mitigate the impact of schizophrenia especially regarding the brain functioning mechanism of patients (Mahone, Maphis, & Snow, 2016). Hence, inferences can be drawn that as research is still being conducted for developing effective treatment, nursing practices must be effectively implemented by the healthcare professionals to ensure positive mental health outcomes of patients suffering from schizophrenia

Conclusion

In conclusion, the topic I have chosen is schizophrenia because it aligns with my future preference for the psychiatric mental health career. Schizophrenia is a condition that is not well known and there are misconceptions in the community about the condition. I believe by understanding its etiology, pathophysiology, and presenting signs and symptoms; I will be able to give the best nursing care to my patients

References

- Coulter, C., Baker, K.K., & Margolis, R.L. (2019). Specialized Consultation for Suspected Recent-onset Schizophrenia Diagnostic Clarity and the Distorting Impact of Anxiety and Reported Auditory Hallucinations. *Journal of Psychiatric Practice*. DOI: 10.1097/PRA.000000000000363
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