

Medication Analysis

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Introduction

Schizophrenia is a complicated disorder that significantly affects an individual's level of functioning in his/her social and occupational life. According to the American Psychiatric Association's (2013) *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*), individuals with schizophrenia may suffer from hallucinations, delusions, disorganized incoherent speech, disorganized or catatonic behavior, and negative symptoms (such as diminished emotional expression) for at least six months or more. The *DSM-5* also reports that it is common for individuals with schizophrenia to present with other associated features including inappropriate affect, dysphoric mood (such as depression, anxiety, or anger), disturbed sleep patterns, and lack of appetite. Depersonalization, derealization, and somatic concerns are also common with individuals suffering with this disorder, which may fuel some of the delusions as well. Cognitive deficits are also common and can cause issues with memory, language, slower processing speed, and impairments in other executive functions. Attention deficits and impulsivity are commonly found, as well as difficulty in social skills (American Psychiatric Association, 2013).

Medications Used for Schizophrenia

There is still a lot of research that is needed regarding the development and treatment of schizophrenia, and medications are the only available treatment at this time. Since there are so many symptoms and deficits that are associated with schizophrenia, there is an abundance of different medications used to treat different aspects of the disorder. Dziegielewski (2009) states that medications that are used to treat the diagnostic symptoms of schizophrenia are in the classification of antipsychotics, which are further separated into typical (traditional) antipsychotics and atypical (non-traditional) antipsychotics. Typical antipsychotics were the first

medications developed to treat schizophrenia but have been found to have multiple moderate to severe adverse side effects. Atypical antipsychotics were developed during the 1990s and have less extreme adverse side effects. Thus, many practitioners use atypical antipsychotics more commonly as the first line of treatment for individuals with schizophrenia at this time (Dziegielewski, 2009). For the purposes of this paper, four medications will be analyzed in depth including one typical antipsychotic (haloperidol), and three atypical antipsychotics (clozapine, olanzapine, and ziprasidone).

How Medications Treat Schizophrenia

All antipsychotics target the psychotic features of schizophrenia including hallucinations and delusions, but each medication targets different neurotransmitters in the brain. Heldt (2017) describes how different neurotransmitters such as dopamine, serotonin, norepinephrine, histamine, and acetylcholine function in the brain, and how adding/withdrawing these neurotransmitters cause different symptoms in the individual. Dopamine is the main neurotransmitter involved in psychotic symptoms, but other neurotransmitters are also involved with the different medications used for schizophrenia. Serotonin is linked to anxiety and depression, norepinephrine is related to the fight/flight symptoms (as well as concentration/attention), histamines can cause allergy symptoms as well as tiredness, and acetylcholine affects physical symptoms and wakefulness/memory (Heldt, J., 2017).

Haloperidol (Haldol), as defined by the College of Psychiatric and Neurologic Pharmacists (CPNP) and the National Alliance on Mental Illness (NAMI), is a typical antipsychotic that is used to inhibit dopamine levels in the brain in order to decrease psychotic symptoms and improve mood in individuals with schizophrenia (CPNP & NAMI, 2016b).

Researchers have found that dopamine is involved with positive symptoms of schizophrenia but is less involved in the negative symptoms (Dziegielewski, 2009).

Clozapine (Clozaril) was the first atypical antipsychotic developed as an alternative to typical antipsychotics and was originally released in the European market in 1960 but was not approved for use in the United States until 1990 (Dziegielewski, 2009). Clozapine inhibits dopamine levels in the brain, but is also a partial agonist for serotonin, meaning it partially binds to serotonin receptors causing mildly increased levels of serotonin released (Heldt, 2017). Therefore, clozapine does assist in decreasing psychotic symptoms such as hallucinations, delusions, and disorganized thinking in patients with schizophrenia, but is also used to help improve mood and decrease risk of suicidal ideations and behavior (CPNP & NAMI, 2016a).

Olanzapine (Zyprexa) is another atypical antipsychotic that is commonly used to treat schizophrenia by inhibiting dopamine levels, but is also a full agonist for serotonin, meaning it fully mimics the serotonin neurotransmitter causing larger amounts of serotonin to be released in the brain. Olanzapine is frequently used as a first line of treatment for individuals with schizophrenia due to the significant effect but also less serious side effects when compared to clozapine (Heldt, 2017). Olanzapine is also used to treat bipolar disorder due to its ability to act as a mood stabilizer (CPNP & NAMI, 2016c).

Last but certainly not least, paliperidone (Invega) is a more recently developed atypical antipsychotic that blocks dopamine, serotonin, and norepinephrine receptors to decrease the level of these neurotransmitters in the brain. It was approved by the Federal Drug Administration (FDA) in 2006 and helps to decrease psychotic symptoms, improve mood, decrease agitation, and mildly sedate individuals with schizophrenia (CPNP & NAMI, 2016d).

Benefits and Side Effects

Heldt (2017) notes that the Third Rule of Neurotransmission is “with great power comes great responsibility” (Heldt, 2017). Typical antipsychotics are extremely effective in treating schizophrenia, but also have extreme and potentially deadly side effects. Haloperidol is effective in reducing positive symptoms of schizophrenia such as hallucinations, delusions, and disorganized speech, but is not found to be as effective with negative symptoms of schizophrenia (Dziegielewski, 2009). Haloperidol can be taken orally or in an injection form and is commonly used in an emergency room and inpatient care settings as a chemical restraint due to the fast-acting sedative nature of the medication when injected (CPNP & NAMI, 2016b). Although effective in treating psychosis, haloperidol (along with other typical antipsychotics) has also been found to have significant extrapyramidal side effects that can lead to movement disorders when taken over long periods of time. These side effects include dystonia (sudden and painful muscle rigidity), akathisia (motor restlessness), and akinesia (loss of voluntary muscle control). Long-term use of the medication can lead to Tardive Dyskinesia (TD) which is involuntary movements of muscle groups, most often the mouth and tongue, and can be irreversible (Dziegielewski, 2009). In more rare cases, use of typical antipsychotics can lead to Neuroleptic Malignant Syndrome (NMS) which is a life-threatening reaction that causes motor dysfunction, autonomic nervous system issues, and sudden changes in mental status which can lead to multiple organ failure and permanent muscle damage (Casarella, 2019).

Atypical antipsychotics were developed as an alternative to typical antipsychotics due to the extreme potential side effects (as listed below). Although atypical antipsychotics cause less deadly and long-term neurological side effects, they can cause more gradual metabolic side effects when used over long periods of time (Heldt, 2017). Clozapine was one of the first

atypical antipsychotics developed and is still largely seen as one of the most effective medications to treat schizophrenia due to its ability to target positive and negative symptoms (Dziegielewski, 2009). Although it is extremely effective, it can cause a very dangerous and life-threatening side effect called agranulocytosis or decreased white blood cell (WBC) count which can then lead to the inability to fight off infections. Because it is such a dangerous medication, it is strictly monitored, and patients must have recurring blood work to evaluate WBC levels (Heldt, 2017). Patients on clozapine can still experience extrapyramidal symptoms and develop TD with this medication, but the incidence is not as high as with typical antipsychotics (CPNP & NAMI, 2016a).

Olanzapine is usually used as the first line of treatment for patients with schizophrenia because of its ability to target positive and negative symptoms of schizophrenia but decreased risk of side effects (Heldt, 2017). It has been shown to be very effective in treating psychotic symptoms as well as improve mood and decrease depressive symptoms and suicidal ideations/behaviors. Although the risk of side effects is less than in other antipsychotics, olanzapine can still cause extrapyramidal side effects and TD in some cases (CPNP & NAMI, 2016c). Olanzapine has also been shown to have the highest amount of weight gain in patients versus other antipsychotic medications (Heldt, 2017). If untreated, significant weight gain can lead to obesity and other metabolic disorders that can cause life-threatening issues later in life.

Paliperidone is one of the newer atypical antipsychotics and helps to treat positive symptoms such as psychosis and negative behaviors such as mood, motor function, and thought patterns (CPNP & NAMI, 2016d). One of the benefits of this medication versus other antipsychotics is that it is not as sedating and patients are able to be more active, and yet is still very effective in treating symptoms of schizophrenia (Iodine, 2020). However, paliperidone has

been found to increase the risk of death significantly in patients who suffer from dementia, therefore it is not usually prescribed to elderly patients. General side effects from antipsychotics including weight gain and extrapyramidal side effects are also possible with this medication (CPNP & NAMI, 2016c).

Interference with Medication Compliance

Medication noncompliance is related to a multitude of factors in patients, but there are a couple huge issues that individuals with schizophrenia face that cause these individuals to have the highest incidence of noncompliance out of all mental health disorders. First, many patients are unable or willing to tolerate the extensive list of side effects that come with taking antipsychotics. These medications can take several days, to weeks, to months to obtain full benefit, but patients may experience the side effects within hours of taking the medication. Therefore, many patients do not like the way the medications make them feel and believe the cons outweigh the pros, so they choose not to take them.

The other reason patients with schizophrenia tend to be noncompliant with their medications is that the whole basis for a diagnosis of schizophrenia is that patients do not function in or process reality the same way as individuals who do not suffer from schizophrenia. They experience delusions, hallucinations, distorted and disorganized thoughts, and mood instability that can cause them to be unreliable in taking their medications. They may simply forget to take their medication, or they may believe the medication is poisoned, or “the voices” may tell them not to take their medication. Overall, if they do not have someone close to them as a caretaker to monitor their medication management, they are very likely to be noncompliant.

Strategies to Help with Medication Compliance

There are many different strategies that can help individuals with schizophrenia be more compliant with taking their medications. Dziegielewski (2009) mentions that it is important to help establish rapport with the client, monitor and educate the client on medication side effects, communicate the necessity of the medications with the client, document the diminishment and absence of positive symptoms with medication use, increase family and support systems, provide other evidence-based therapies (such as cognitive behavioral therapy) that can explore thoughts and feelings and restructure irrational beliefs, and assist the client in recognizing that his/her symptoms are due to illness not something they have done (Dziegielewski, 2009). Since antipsychotic medications are one of the only options for treating schizophrenia, a lot more research is needed to determine better options, including non-medication options.

The utilization of paliperidone is another way that physicians have found to increase medication compliance in patients with schizophrenia. Paliperidone can be administered as an injection once per week at a physician's office rather than taking a pill every day, and therefore is easier to have patients follow through with it. This also allows easier monitoring of patients' use of the medication. Dr. Bryan Cheever (2020), recommended that social workers should incorporate incentives with the use of paliperidone to help encourage patients to follow up regularly. These incentives may include free meals, free counseling session, etc. to allow clients to choose to follow up on a weekly basis (B.D. Cheever, personal communication, June 21, 2020).

Conclusion

In conclusion, schizophrenia is a very difficult disorder to treat and medications are the main treatment option at this time. It is important to know that the side effects of antipsychotics are extensive and may cause medication noncompliance in patients along with the effects of the disorder itself. Social workers can help by providing incentives for clients, encouraging support systems, educating clients on medications and other behavioral techniques, and monitoring their medication use. It is important to advocate on behalf of individuals with schizophrenia and encourage more research in treatment options to provide the best quality of life with minimal risk.

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