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The Efficacy of Antipsychotic Medication and Metacognitive Training in Managing Delusions in Schizophrenia: Treated vs. Untreated Patients

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Abstract:

In this paper, it discusses how persecutory delusions are the most common and troubling symptom in schizophrenia, leading to patients' psychological distress and inability to live a normal life, among other issues. Patients who have not received treatment have a higher likelihood of increased violent behavior, how systematic reviews have found a strong indication between delusions and violent behaviors and actions, which is a major reason patients tend to have violent tendencies. This paper also emphasizes the several types of persecutory delusions and explores the effectiveness of antipsychotic medications treatments, especially combined with MCT. The research results indicate that combining medication treatment with MCT is the most effective treatment method.

Keywords: Antipsychotic Medication; Metacognitive Training; Delusions; Schizophrenia, Violence

1. Introduction

How do antipsychotic medications and metacognitive training help control schizophrenia patients, particularly those with persecutory delusions and hallucinations? This paper explains what schizophrenia is and how violence is related to persecutory delusions. It explores the consequences for patients who do not receive timely treatment or fail to comply with treatment plans, highlighting how this can negatively affect both the patient and those around them. The paper emphasizes the treatment methods used to manage the condition, such as antipsychotic medications and metacognitive training, which help patients gradually improve. While it does not discuss a complete cure, it explains how these treatments help reduce instances of violent behavior, delusions, and hallucinations.

2. What is schizophrenia?

Schizophrenia is a persistent mental disorder characterized primarily by abnormalities in perception, emotion, and behavior. These symptoms include hallucinations (e.g., hearing voices that do not exist), delusions (e.g., believing that others intend to harm them), social impairments, communication difficulties, and cognitive dysfunction. Behaviors commonly observed in individuals with schizophrenia include

talking to themselves, laughing alone, being overly suspicious, appearing lethargic, displaying disorganized thinking, and exhibiting inappropriate emotional responses. These conditions significantly impact the patient's life, making it rare for them to maintain consistent periods of normal functioning [10]. At the same time, a combination of antipsychotic medication and metacognitive training (MCT) has been shown to improve outcomes in reducing delusional symptoms in patients [8]. Antipsychotic medications are commonly used to regulate the dopamine activity associated with delusions and hallucinations in schizophrenia.

3. Antipsychotic Medication and MCT's Role in Persecutory Delusions

Persecutory delusions are a common symptom in delusional disorders. Individuals suffering from persecutory delusions often experience heightened insecurity, frequently suspecting that others intend to harm them, which induces psychological fear and results in harm to both mind and body [2]. The cognitive behavioral model of persecutory delusions indicates that these delusions arise from multiple factors, such as environmental stress, personal resilience, and brain function. However, the most critical element is dopamine, which is central to schizophrenia research and is considered a key factor in the disorder's development. Researchers believe that excessive dopamine activity in the brain, particularly in the mesolimbic pathway, significantly increases the likelihood of delusions and hallucinations [5]. Patients with untreated schizophrenia are more likely to develop persecutory delusions, will increase the risk of violent behavior, and leading to severe disability if left untreated [4].

In the article "Association of Violence with Emergence of Persecutory Delusions in Untreated Schizophrenia," by Keers et al. (2014) have studied the relationship between persecutory delusions and violent behaviors, they found a strong correlation between mental disorders and violent actions in patients who have not received treatment. Those untreated patients face a higher risk of engaging in violent behavior because they frequently feel the need to protect themselves, regardless of the consequences for others or themselves.

Persecutory delusions can be categorized into diverse types: hint delusion, hypochondriacal delusion, and suicidal delusion. Hint delusion is particularly peculiar, where patients perceive that other's behaviors, whether positive or negative, are directed at them, leading to misunderstandings that worsen mental health issues. Hypochondriacal delusion involves irrational beliefs about having a severe physical illness or incurable condition, compelling individuals to constantly seek medical attention. This delusion is common in schizophrenia and other mental disorders, especially during menopause and old age. Suicidal delusions often involve frequent thoughts of suicide, which, without early diagnosis and treatment, can have severe consequences. These patients typically exhibit personality defects, such as hypersensitivity, strong self-esteem, and egocentrism, traits often linked to childhood trauma, lack of care, and difficulties in forming healthy relationships [1]. The importance of intervention and treatment to mitigate the risk of violence in schizophrenia patients cannot be overstated.

Antipsychotic medications are the primary treatment for schizophrenia and are the primary method of treating schizophrenia, meaning that these drugs were specifically developed to address the disorder. Their main function is to reduce the severity of delusions, hallucinations, and other positive symptoms. Antipsychotics work by blocking dopamine receptors in the brain, particularly in the mesolimbic pathway, which reduces dopamine activity and, in turn, lessens delusional thinking and other psychotic symptoms [8]. Through this research, scientists found that antipsychotic medications significantly reduce positive symptoms in schizophrenia patients. However, the study also highlighted that while these medications are effective at alleviating some positive symptoms, they have limitations in addressing cognitive deficits and negative symptoms. Those two areas play crucial roles in the broader context of schizophrenia, and if left untreated, it becomes challenging to fully manage the disorder [8]. Patients with persecutory delusions, for example, would continue to experience such symptoms, as well as hallucinations, without more comprehensive treatment approaches.

Although antipsychotic medications can effectively reduce persecutory delusions, they often do not address negative symptoms. As a result, researchers have developed Metacognitive Training (MCT), which offers better cognitive outcomes for patients. MCT works by enhancing patients' awareness of cognitive biases, such as interpreting situations and controlling emotions. It helps patients identify and correct cognitive distortions, like attributing malice to others, enabling them to achieve clearer thinking. While antipsychotic works by blocking dopamine receptors, MCT improves cognitive insight, allowing patients to suppress delusions and engage in healthier social interaction [8]. Research has also shown that patients who only receive antipsychotic treatment exhibit less improvement compared to those who undergo MCT. However, when these two treatments are combined-antipsychotics and MCT- the level of improvement in delusions is significant-

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ly higher.

4. Finding in violence and untreated persecutory delusions

There is a significant correlation between untreated persecutory delusions and violent behavior, with untreated patients being more prone to violence. The threats and fear experienced by individuals with persecutory delusions often lead to defensive aggression, manifesting as violent actions [7]. For patients with persecutory delusions, violence does not occur only when they are harmed or in a dangerous environment; rather, it arises when they feel threatened, even if no real danger exists. Schizophrenia manifests in several ways, and its symptoms are typically categorized into two types: positive and negative symptoms. Positive symptoms are outward visible and easily identifiable, such as hallucinations, delusions, and disorganized behaviors. Negative symptoms, in contrast, are harder to recognize and include impoverished thinking, emotional indifference, and lack of motivation [10], often leading to a disconnecting from the external world.

Among the positive symptoms of schizophrenia, auditory hallucinations are the most common, but patients may also experience visual, olfactory, gustatory, tactile, and visceral hallucinations. Delusions can take various forms, with persecutory delusions and referential delusions being the most frequent, though other types, such as jealousy delusions, may also occur. Cognitive disorders include scattered thinking, derailment, and echolalia. Disorganized behavior can involve alternating catatonic excitement and catatonic stupor, with patients potentially experiencing both states within a short period of time [7]. These are all common symptoms of schizophrenia. In schizophrenia, unlike positive symptoms, negative symptoms include a lack of speech, communication, emotional indifference, and unwillingness to participate in family plans or social interactions and activities. Patients may become passive and isolated, showing little to no interest in people or objects around them. These behaviors often lead to a decline in willpower, hopelessness about the future, and a lack of plans or goals, with patients sometimes neglecting personal hygiene. If these issues are not addressed, early warning signs may emerge, which could potentially escalate to violent behaviors [9].

Neurological patients may develop mental disorders. For example, epilepsy patients may exhibit typical anxiety or depression symptoms before and after seizures, which are related to the brain's lack of oxygen during seizures and feelings of stigma. These patients may experience abnormal blushing, sweating, fluctuating interest levels, and in some cases, personality disorders or manic aggression, referred to as epilepsy-induced mental disorders. Similarly, Alzheimer's patients, who have become increasingly prevalent in recent years, also experience typical anxiety and depression symptoms. Some may even show signs of delusion, dramatic personality changes, irritability, and suspicion, which are linked to changes in the brain, feelings of stigma, and a lack of social support [4]. Furthermore, long term, or frequently recurring illnesses can lead to psychological and mental health problems due to feelings of shame, internal rejection, and emotional repression.

For patients that are experiencing persecutory delusions, they will think all the friendly people around them are just trying to get them, trying to let guard down so the others around them can skin the patients alive. Even if they do not intend to hurt the patients, the others must look down on the patients, and if the patients make them unhappy, they will kill the patients without hesitation. Because in the patient's world, they are compared an animal, their life will never be as valuable as a human's. No matter how nice the others seem, the patients will always think humans would never treat them equally. When the patient's condition worsens, they can hear their heartbeat, and it drives them to tears and sweat because it is so terrifying. But the more scared the patients get, the faster the heart beats, the louder the sound gets, and the worse the situation becomes. Sometimes, the patients even think about cutting out the heart, but they are afraid that without the flesh muffling it, the sound will only get louder—like taking a ringing phone out of a bag. When the patient's thoughts become clearer, they realize that what they are hearing is not their heartbeat, but rather the sound of their arteries, something others typically cannot hear. However, soon after this realization, the patient spirals back into confusion and delusion, becoming overwhelmed with fear again. On the surface, it may not seem dangerous, but despite having no intention of harming others, the patient's persecutory delusions and intense fear could drive them to react aggressively if provoked. Their primary fear is being "skinned alive," so they feel as though they have no choice but to defend themselves. Even a cornered rabbit will bite back, do not even mention it being a human. Although the patient cannot predict what might trigger them, when they believe their life is under threat and there is no escape, they instinctively prepare to fight out of desperation.

Supporting these findings, a meta-analysis by Fazel et al. (2009) also demonstrates a strong relationship between persecutory delusions and violent behaviors. Their analysis is compiled data from 20 studies, encompassing 18423 individuals diagnosed with schizophrenia or other psycho-

sis. One critical finding was the role of substance abuse comorbidity in elevating the risk of violence. Patients with both schizophrenia and substance abuse had significantly higher odds of engaging in violent behavior compared to those distort the patient's perception of reality, increasing the likelihood of aggressive response to perceived threats [3].

5. Finding in Antipsychotic Medication and MCT

The combination of antipsychotic medication and metacognitive training (MCT) is highly effective for treating schizophrenia patients. Compared to those who only receive antipsychotic medication, patients undergoing both treatments show significant improvement in delusional symptoms. MCT helps patients better engage in social interactions and respond appropriately to others. By improving cognitive insight, MCT helps suppress delusions and intrusive thoughts. This demonstrates that MCT is an effective complement to antipsychotic treatment, as it addresses cognitive deficits and social functioning, while antipsychotic medication primarily targets positive symptoms [8]. Together, they form a complementary approach.

Compared to Antipsychotic medication alone, combining medication with psychological interventions typically leads to better outcomes for schizophrenia patients. Earlier, it was mentioned that MCT is proven through research to be an effective method. It has been shown to reduce symptoms and improve long term outcomes in terms of symptoms reduction and quality of life. Unlike other methods, MCT directly targets delusions and cognitive biases. Another similar approach is Cognitive Behavioral Therapy (CBT), which focuses more on reducing the distress associated with delusions but does not fully address the cognitive distortions that cause the delusions [8,11]. The key difference is that MCT directly addresses these cognitive distortions, explaining why it is more effective in this area compared to other treatments. While other therapies and treatments may help reduce the distress related to delusions, MCT focuses on resolving the root causes of the cognitive biases that drive these delusions. This makes MCT a more targeted and effective treatment for managing the cognitive components of schizophrenia.

One challenge researcher face when evaluating the efficacy of combined treatment approaches is the variability in patient responses. Particularly, maintaining patient adherence to long term treatments protocols can be difficult. The side effects of MCT and antipsychotic treatment may lead to dropout rates [8].

6. Action

Persecutory delusions, which often involve the belief that one is being targeted or harassed, create perceptions of threats that significantly increase the likelihood of violent behavior. The cognitive pathway includes thought processes such as jumping to conclusions and attributing hostile intentions to neutral or ambiguous events. Patients with persecutory delusions are often hypersensitive to perceived threats, leading to defensive reactions. Emotionally, these delusions provoke fear, anxiety, and anger, which create an internal environment primed for reactive aggression. The combination of heightened emotional arousal and distorted cognitive assessments results in actions that are often violent or aggressive as the patient attempts to protect themselves from perceived threats [1].

Antipsychotic medications work by regulating dopamine, a neurotransmitter associated with reward and pleasure but also implicated in the manifestation of psychotic symptoms such as delusions and hallucinations. Antipsychotics, particularly those that block dopamine D2 receptors, help reduce overactivity, thereby alleviating the intensity of delusions and hallucinations [8]. By diminishing the severity of these symptoms, antipsychotics lower the emotional arousal and threat perceptions that often lead to violence in patients with persecutory delusions. Metacognitive Training (MCT) complements antipsychotic treatment by addressing the cognitive biases that sustain persecutory delusions. MCT involves structured exercises that help patients recognize and correct cognitive distortions such as jumping to conclusions, misattributing intent, and overestimating the likelihood of negative events. By improving cognitive insight, MCT enables patients to develop more accurate interpretations of social cues and reduce the conviction of their delusional beliefs. When combined with antipsychotics [8], MCT enhances overall treatment outcomes by not only reducing delusional severity through pharmacological means but also by empowering patients with the cognitive tools necessary to challenge and manage their delusions more effectively, leading to reduced violence and improved functioning in daily life.

7. Risks

Discontinuing antipsychotic treatment or MCT presents risks for schizophrenia patients. Without the pharmacological regulation of dopamine activity, the brain is prone to heightened psychotic episodes, which may lead to a return of delusional thoughts and increased emotional distress. MCT helps patients maintain cognitive control over their delusional thoughts and manage cognitive distortions. Discontinuing MCT may result in patients losing the cog-

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nitive tools necessary to challenge and manage delusional beliefs effectively, potentially leading to a worsening of symptoms and compromised daily functioning.

8. Method

To find out the relationship between persecutory delusions and violence in untreated schizophrenia, investigate through a range of peer reviewed studies and articles that have connection between mental disorders and violent behaviors. Articles written by Moritz and Keers are the centerpiece of this paper, it is selected not only because their focuses is on persecutory delusions, the impact of untreated patients, and the role of antipsychotic treatments and MCT in managing schizophrenia, is because both articles did a research based on the medication they have used or compared patients with treated vs. untreated.

The literature review process involved a database search such as PubMed, PsycINFO, and google scholar, included keywords like “Antipsychotic Medication,” “Metacognitive Training,” “Delusion,” “Schizophrenia,” and “Violence”, the articles that have been discovered are all relevant, and this paper not only utilizes the treatment method provided in the articles but also explores similar yet distinct approaches that is not mentioned in the articles. It also examines whether these treatment methods can be applied effectively or are deemed ineffective.

All the evidence and data were extracted from studies involving patients diagnosed with schizophrenia and other relevant research. The focus is on the presence of persecutory delusions and whether they are associated with violent behavior, as well as how to mitigate these symptoms to improve the quality of life for patients. Through analyzing these articles, the research provides insights into the cognitive mechanisms behind persecutory delusions and the role of dopamine in their persistence. The combination of medication and metacognitive training (MCT) has been shown to be the most effective treatment approach, as it can intervene in violent tendencies and reduce the long-term impact of severe delusional symptoms, aiming to help patients live a more normal and happier life.

9. Result

According to Table 1, MCT shows significant improvements in reducing delusional symptoms and conviction compared to Cogpack. Cogpack is a cognitive remediation suite that offers cognitive remediation solutions for clinicians and their clients [8]. Cogpack also shows improvement but when compared to MCT it is less effective and less consistent. It can be observed that through MCT (Metacognitive Training), patients with mental disorders have significantly improved in controlling their emotions and actively participating in the training. However, this mainly addresses the negative symptoms of the disorder. When combined with antipsychotic medications, the two treatments complement each other. MCT has proven to be effective in meeting patients’ needs and assisting them in managing their symptoms, while the role of antipsychotic medications is to stabilize dopamine levels, preventing an excess of dopamine from affecting the patient’s body.

Table 1: Delusion sub score in MCT and Cogpack

MCT (n=24)		Paired *t* test difference	CogPack (n=24)		Paired *t* test difference	Statistics (df=1,45) ANCOVA
Pre	Post		Pre	Post		
9.04 (3.47)	6.58 (2.26)	t=4.38 p<0.001	10.04 (3.86)	8.79 (4.36)	t=2.77 p=0.01	F=4.97, p=0.03, $n^2 = 0.10$

10. Discussion

Both articles, “Association of Violence with Emergence of Persecutory Delusions in Untreated Schizophrenia” and “Antipsychotic Treatment Beyond Antipsychotics: Metacognitive Intervention for Schizophrenia Patients Improves Delusional Symptoms.” Those two articles clearly explain the combination of antipsychotic medication and Metacognitive Training (MCT) has been proven to be particularly effective in managing persecutory delusions and reducing violent behavior. Antipsychotic medications primarily target positive symptoms, such as delusions and hallucinations, by regulating dopamine activity. Controlling dopamine levels helps reduce the intensity of persecutory delusions, leading to less violent and delusional behavior. This stabilizes the patient’s cognitive system and improves overall functioning. On the other hand, MCT complements this by reducing the conviction of delusional beliefs and stabilizing the patient’s mental state. Although these treatments do not completely cure mental illness, long term use of both antipsychotic medications and MCT can significantly improve cognitive functioning and reduce violent tendencies in patients with schizophrenia.

11. Conclusion

In conclusion, this paper highlights the effectiveness of combining antipsychotic medication with Metacognitive Training (MCT) for treating schizophrenia is evident, par-

ticularly in reducing persecutory delusions and mitigating violent behavior. Antipsychotic medications address dopamine regulation, while MCT helps correct cognitive distortions and enhances cognitive control in patients. The key lies in the necessity of early and sustained treatment, which can timely intervene and prevent more severe conditions from developing. Discontinuing treatment can lead to relapse and an increase in violent behavior. There is also a need for further research to improve patient adherence, as without patient compliance, studies may fail to achieve their full potential. Since each patient with schizophrenia has varying degrees of symptoms, it is essential to develop personalized strategies, integrate supportive care models, and ensure that patients have the tools and resources needed to maintain treatment continuity. However, patient non-compliance is a significant concern, and a plan is necessary to ensure better research outcomes and patient management.

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