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## The Role of Pharmacological Therapy and Psychotherapy in Post Stroke Depression

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### ABSTRACT

The most prevalent emotional illness following a stroke is post-stroke depression. Some of the symptoms of post-stroke depression include loss of interest, decreased energy, decreased appetite, problems sleeping, self-blame, and even suicide thoughts. To overcome the symptoms of post-stroke depression requires comprehensive management. In the PSD population, antidepressant medication has demonstrated to be effective. In order to obtain comprehensive health services, rehabilitation activities are also required as one of the therapies in the psychological sector of patients with post-stroke depression.

### 1. Introduction

Post-stroke depression (PSD) is a depressive and anhedonic mood disorder triggered by a stroke. Depression symptoms improve gradually over the first six months, then fade significantly around 12 months before worsening again in the second year after the stroke. Sleep difficulties, weariness, weight fluctuations, and apathy are common symptoms of PSD, which lengthen hospital stays and restrict PSD sufferers' involvement in rehabilitation programs, resulting in lower functional improvement. Patients with post-stroke depression (PSD) have more complicated clinical symptoms. Patient performance is frequently split into core symptoms and non-core symptoms in clinical settings. The patient is dissatisfied, loses interest and pleasure in the things

they used to enjoy, and is unable to find enjoyment in the things they used to enjoy. They also have diminished energy, are easily weary and may have suicidal thoughts. Weight loss, difficulties sleeping, sleeplessness, nightmares, unexplained loss of appetite, anxiety, and a sense of worthlessness are all non-core symptoms.<sup>1,2</sup>

PSD is classified as a mood disorder caused by a general medical disease (e.g., stroke) with determinants of depressive features, major depression-like episodes, manic features, or mixed features, according to the Diagnostic and Statistical Manual (DSM) IV. Persistent depression not only worsens the condition, but it also makes it difficult to function socially and increases the risk of suicide.

Furthermore, this disease has the potential to impair cognitive performance, functional rehabilitation, and survival. Researchers discovered that brain injury can cause physiological and psychological abnormalities in 368 stroke patients who were hospitalized within three months in a study of PSD and post-stroke fatigue.<sup>3,4</sup>

The severity of a stroke has a direct impact on a patient's quality of life and is a significant factor in the development of post-stroke depression (PSD). Many studies demonstrate that in the early stages of stroke, a change in the patient's ability to carry out everyday tasks is linked to the emergence of post-stroke depression (PSD). The more serious the nerve damage, the less able the patient is to function in daily life, and the higher the risk of post-stroke depression (PSD). The incidence of post-stroke depression and activities of daily living (ADL) has a substantial association. With severe physical dysfunction, a lack of self-care abilities, and the inability to the workplace the patient is under a significant deal of psychological stress, leading to post-stroke melancholy (PSD).<sup>5</sup>

Because PSD affects one out of every three stroke patients, it is a common problem in daily clinical practice. More than half of the cases go undiagnosed and untreated, which should raise our alarm. In this unpleasant scenario, neurologists have a critical role in the care and management of stroke patients, thus they must be well-versed in the early detection and treatment of PSD.<sup>6</sup>

### **Etiology**

The pathophysiology of post-stroke depression (PSD) is complicated, including a variety of elements including biological and social psychological systems. Pathogenesis in biological mechanisms reveals that noradrenergic and serotonergic neurons involved in emotion regulation in the brain are located in the brain stem and have a role in the pathogenesis of post-stroke depression, according to a number of studies (PSD). In the frontal lobe and anterior cingulate gyrus, glutamate ratios were considerably higher in PSD patients. 5-HT and NE are monoamine neurotransmitters that have been linked to sadness,

anxiety, suicidal self-injury, and sleep problems. Acute stroke is a stressful event that causes glucocorticoid secretion to rise, resulting in an increase in blood glucose and aberrant neurotransmitters, which can contribute to depression. Subcortical white matter loss causes depression susceptibility by disrupting key neuronal circuits associated with emotion, according to recent brain imaging studies of depression. The prefrontal cortex, anterior cingulate gyrus, amygdala, ventral striatum, hippocampus, insula, thalamus, and basal ganglia are all affected by depression.<sup>1,7</sup>

The emergence of PSD is not a single mechanism. Post-stroke depression (PSD) is the same as other psychiatric diseases, where there are medical factors, bio-psycho-social factors, and psychological factors that can contribute to the onset of post-stroke depression (PSD). Psychosocial factors such as the poor ability of PSD sufferers to carry out daily life, bad life events, being a burden on the family, and lack of family support, community support, or local residents can contribute to the emergence of post-stroke depression (PSD). Research has shown that a low level of education is correlated with the incidence of post-stroke depression (PSD). This is thought to occur because patients with low levels of education have low cognitive levels so stroke sufferers with low levels of education are less able to understand what care they can take after having a stroke so that they cannot carry out daily activities with their limitations. as a result of their stroke. This is the basis that a low level of education is correlated with the occurrence of post-stroke depression (PSD).<sup>1,7</sup>

### **Risk factor**

One of the most important risk factors for post-stroke depression is a patient's medical history of depression or other psychiatric problems (PSD). A family history of mental problems is another key factor that contributes to the occurrence of post-stroke depression (PSD). The findings revealed that having a family history of mental problems was highly linked to the development of post-stroke PSD depression in both the acute and subacute periods. One of the most

important risk factors for the formation of post-stroke depression is the severity of the stroke (PSD). This is because, as a result of brain injury, individuals with stroke may have lingering symptoms such as mobility abnormalities, malfunction, and challenges in everyday life, which can diminish self-confidence in stroke patients. Several studies have linked ischemic lesions in the right hemisphere to the development of post-stroke depression (PSD). Damage to the left hemisphere, particularly the left frontal lobe and left basal ganglia, was linked to the development of poststroke depression (PSD) in both the acute and subacute stages, implying that the site of the lesion was linked to PSD. This is based on the idea that the left hemisphere is the dominant hemisphere, responsible for emotion and language, and that, according to contrast imaging data, the degree of neurological loss in the left hemisphere is more severe in stroke patients. Strokes that cause brain injury in the dominant emotional hemisphere or emotional circuit are more likely to cause depressive symptoms, and psychosocial factors have a role in the development of post-stroke depression as well (PSD).<sup>2,3,4</sup>

### **Pharmacological therapy**

Symptoms of post-stroke depression usually begin within the first month following a stroke and progress to chronic status over time. The intensity and disability of a stroke, cognitive impairment, personality, general vascular damage, and psychological and genetic variables all have a role in the onset of depression. Antidepressant therapy has been demonstrated to be effective in people suffering from post-stroke depression (PSD). Antidepressants work by stimulating neurogenesis and altering the plasticity of newly formed neurons. Those advantages can be extended to mood symptoms, resulting in improved motor, cognitive, and executive functions.<sup>8,9</sup>

Antidepressant medicines may be useful in treating PSD, according to a scientific statement published by the American Heart Association Stroke Board. Depression is commonly treated with selective

serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs). Because their side effects are often well tolerated, SSRIs are considered the treatment of the first choice. SSRIs play a role in complicated signaling pathways that lead to enhanced neurogenesis, which activates axonal buds and encourages the formation of new synapses.<sup>8,9</sup>

In a recent study, patients on SSRIs had a decreased incidence of PSD and a substantial improvement in motor performance when compared to placebo controls. The positive effects of SSRIs on parameters like motor recovery, cognitive/executive function, and partial or complete independence in everyday living were linked to a higher quality of life. SNRIs are another type of medication used to treat PSD. However, owing to their negative effects, SNRIs should be used with caution. Irritability, sleeplessness, nausea, vomiting, and cardiovascular reactions are also common adverse effects of SNRIs.<sup>10,12</sup>

It must be understood that antidepressant therapy is not without risk. The usage of SSRIs has been linked to an increased risk of hemorrhagic complications and falls in the elderly. SSRIs have also been linked to an increased risk of stroke, myocardial infarction, and all-cause death in other epidemiological studies. The antidepressant effect could be related to interactions with other variables such as depression, disability, and concomitant medical illnesses, which need to be investigated further. Finally, the American Heart Association advises using antidepressants for PSD, which should be continued for at least 6 months following recovery. The selective serotonin reuptake inhibitors escitalopram and paroxetine are the most effective antidepressants.<sup>8,9,10</sup>

Citicoline is an endogenous nucleotide molecule that participates in the biochemical process of phosphatidylcholine formation and is one of the most prevalent cell membrane lipids in human and animal tissues as an adjuvant antidepressant medication. Citicoline enhances brain functioning, reduces cognitive deficiencies, and improves memory performance through participating in neural

processes. As a result, citicoline has been successfully utilized as a neuroprotective drug to reduce the degeneration of neurological illnesses and glaucoma, as well as to prevent neuronal aging and improve memory. Citicoline improves the depressed profile by increasing norepinephrine and dopamine levels in the central nervous system by affecting brain metabolism and neurotransmitter regulation.<sup>9</sup>

However, it is still uncertain when antidepressant medication should begin and how long it should last. Although no substantial effects were identified in the early phases of medication administration, Fruehwald et al reported that three months of fluoxetine treatment in PSD patients can considerably boost emotional and functional recovery at 18 months post-stroke. A single-blind RCT in a Chinese population similarly indicated that six months after a stroke, the effects of a three-month citalopram treatment program were more effective. These findings suggest that the medications' effects may be hidden by other clinical circumstances, and more research is needed to evaluate whether PSD treatment should be divided into three phases: acute, consolidation, and maintenance. If the chosen medications are effective, pharmacological therapy should be continued for at least 6 to 12 months, according to the 2015 update of the Canadian Stroke Best Practice Recommendations. In the case of PSD, the maintenance phase of treatment could be shortened, lasting two to three months after the depressed symptoms have subsided.<sup>10</sup>

### **Psychological therapy**

Limited activity gradually affects the patient's mood and self-confidence; in times of difficulty and stress, strong family and social support are extremely beneficial and important for them, as it can help them adjust to their disability and arouse their enthusiasm for participating in social activities. In the treatment of PSD, supportive psychotherapy and cognitive behavior therapy (CBT) has been demonstrated to be beneficial. Social support therapies are extremely beneficial in reintegrating patients back into society and

reestablishing relationships with others. PSD can be avoided or lessened with social support from family, friends, and co-workers, who are encouraged to visit more regularly, provide more company, and encourage the patient to accept therapy and rehabilitation exercises positively. CBT aims to change stroke patients' cognitive activity by identifying inappropriate modes of thought and their counterproductive ideations, inspiring patients to adopt reasonable thoughts and abandon self-destructive ideas and emotions, and then re-constructing neuronal circuits to correct cognition and behavior. Balancing psychotherapy (BPT) is a treatment strategy that incorporates several psychological schools and is based on eastern philosophy systems. To begin, psychosomatic balancing theory and methods are employed to remove the sources of PSD and mental obstruction, both of which disrupt internal equilibrium. The patients are then given hints that will help them gain a more holistic understanding of their problems. Following that, patients learn to objectively analyze themselves and reconstruct their cognition, achieving inner equilibrium by comparing their experiences to similar events in other people's life. In the treatment of mild and severe depression, psychotherapy is preferred as a compliment. cognitive behavioral therapy was the most effective psychotherapeutic intervention.<sup>11,12,13,14</sup>

To improve post-stroke rehabilitation outcomes and improve stroke patients' quality of life, preventive interventions should be carried out for stroke patients with severe disabilities, a history of depression, cognitive disorders, or anxiety disorders, or stroke patients who do not have family or people who can care for stroke sufferers. Those with carers have significantly lower depression scores than patients who do not have a caregiver. Patients with stroke who had caretakers exhibited lower depression levels than those who did not. This demonstrates that social support from family or caregivers is critical in the psychological therapy of post-stroke depression patients. Post-stroke depression can be reduced with non-drug psychosocial intervention therapy. In

individuals with post-stroke depression, psychotherapy can be repeated 12 to 20 times (PSD). Patients suffering from post-stroke depression may require various forms of social support at various periods. Caregivers' ability to care for post-stroke patients is a type of psychotherapy help that can be provided early on and then followed by social support. The therapist provides social assistance and health education in the form of emotional and informational support to satisfy the physiological and psychological needs of stroke patients. The presence of social support provided to stroke patients is linked to the prevalence of post-stroke depression, with patients who receive social support from therapists, family, and the environment having a lower incidence of post-stroke depression than those who do not.<sup>11,12,13,14</sup>

## 2. Conclusion

As a first-line treatment for PSD, antidepressant medication and psychotherapy should be tried. As soon as the patient is identified with PSD, antidepressant medication is recommended. Treatment options are determined by the patient's traits and overall health, as well as the intensity of symptoms and potential adverse effects. The mechanism of PSD must be identified in order for future research to lead to particular therapeutic strategies. To summarize, doctors and other healthcare professionals should be aware of PSD and be able to diagnose the disease early on in order to assist patients in overcoming their depression as rapidly as feasible. In combination with antidepressant medication, brief psychosocial therapy emphasizing care management, psycho-education, and family support may be useful for treating or avoiding PSD.

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