



Post – Stroke Depression: A Review

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ABSTRACT

The third leading cause of death is stroke, mainly occurred in patients with 50 years or more and it is described as a sudden loss of blood flow to the brain that leads to irreversible tissue damage caused by thrombotic, embolic, or hemorrhagic events. While stroke related psychiatric complications have been recognized for over a century, they have never received the same degree of attention as post stroke motor deficits, language difficulties, or intellectual disturbances. Some of these stroke clinical complications, such as depression and whereas anxiety or emotional liability are other complications. Depression after stroke is associated with a lower quality of life and also with a higher risk of dying. After a stroke, approximately one third of patients experience depression. It's important to correctly test for and diagnosis post stroke depression, as well as determine the seriousness of the disease. PSD is related to a variety of stroke risk factors and it can be fatal if left untreated. There is good evidence that early initiation of antidepressant treatment is associated with a decreased risk of developing and successful prevention of PSD in non depressed stroke patients. PSD requires special care, and consensus on the diagnosis and treatment of PSD should be achieved.

Keywords: Antidepressant, depression, Post stroke depression, Stroke

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INTRODUCTION

Stroke made up the third-leading cause of disability –adjusted life-years (DALYs) worldwide, with total of 132 million DALYs¹. Stroke or cerebral vascular event (CVA) involves loss of brain function caused by disruption of blood supply to brain. The stroke can leave individual with a residual damage of physical, psychological, social and cognitive function. According to World Health Organization about 15 million people suffer from stroke each year². Stroke is associated with psychiatric symptoms such as depressed mood, anxiety and apathy³. The most form of depression after a stroke is Post-stroke depression (PSD) and is considered as the most common and severe neuropsychiatric complication of a stroke, significantly depression affects about one-third of stroke survivor's survival⁴. Furthermore, this disorder has the ability to have a detrimental impact on cognitive and functional abilities recovery and long term survival⁴. However, since depression after a stroke is linked to worse outcomes, early screening and evaluation of depressed mood can be useful⁵. Based on the majority of available data, as well as poor long term functional outcomes depression after stroke related to a decline mobility limitation in daily life in recovery care effectiveness, cognitive disorder, living behavior's⁵. Depression after stroke is related to high mortality rate and also explores the strong relationship between stroke and depression⁵

Prevalence and Incidence

While some physicians use DSM-III and DSMIV guidelines to diagnosis PSD, some use a different kind of scales or questionnaires. Furthermore various physicians use different cut-off scores to diagnose PSD using the same scale or questionnaire. It's also important to remember that these scales were designed to measure the magnitude of depression rather than to diagnose it. Due to these methodological problems, determining the true prevalence of PSD is difficult⁶. Depression is normal after stroke, affecting around one third of stroke survivors and most cases symptoms appear within three months⁷. The incidence in year 1 ranged from 10% to 15%, cumulative incidence ranged from 39% to 52%, and 15% to 50% of patients with PSD within 3 months of stroke recovered 1 year later. The prevalence rates did not vary significantly over time (within 1 month from stroke, 1–6 months, or 6–12 months) or by setting within the first year after stroke (hospital, rehabilitation, or population based)⁸.

Major Risk Factors of PSD

PSD is influenced by socioeconomic state, age, genetic factors, and time of assessment after stroke, severity of stroke, location of lesion, education level and other associated risk factors⁹.

Genetic factors:

A few genes have been investigated as PSD risk factors 5-HTTLPR and the STin2 VNTR polymorphism of serotonin transporter gene (SERT) associated with PSD in stroke survivors⁹

Medical and psychiatric history:

PSD has no relation with cardiovascular risk factors such as hypertension and hypercholesterolemia. A personal history of depression and anxiety was a risk factor for PSD and also family history of depression associated with PSD⁹

Stroke characteristics and lesion location:

Stroke patients were classified as ischemic stroke and hemorrhagic stroke among these 85 % cases occurs as ischemic stroke. The frontal area is more vulnerable to post stroke depression than the non frontal region, due to the location of the lesion ⁹

Demographic factors:

Gender was not a risk factor for PSD⁹. According to American Stroke Association, women suffer from post stroke depression compared to men⁷

Functional and cognitive impairment:

If patients having severe cognitive impairment , as assessed by using mini mental state examination (MMSE) and exclude the patients were score less than 18 for literate and 16 for illiterate. Cognitive problem after stroke confirm the symptoms of depression ¹⁰

Socioeconomic status:

It can be assessed by Arabic validated scale and it was classified as low, middle and high. It consists of 4 dimensions like parent's life style, parent's education, parent's annual income and parent's occupation ¹⁰

Pathogenesis of PSD

The exact mechanism that contributes to depression after a stroke is still unclear. The PSD is based on the anatomic position of brain lesions contributed to the recognition of this disorder as a psychiatric condition involving the disturbance of particular mood regulating pathways¹¹. The PSD mainly occurred due to social, psychological and economic stresses that rises after stroke or due to disruption of neural circuits involved in mood regulation⁷. While intriguing, these results have not been reliably repeated, and some studies have indicated that depression could be related with lesion in the right hemisphere. Furthermore, in the first month after a stroke, a strong correlation of PSD with lesions in the left hemisphere was discovered, and in the right hemisphere after 6 months¹¹.

Silent ischemic stroke and vascular depression shows that depression also occur without any warning signs because lesion being smaller and less aware of it. The patient with smaller amygdala

from ischaemic changes of stroke increases the vulnerability of stroke⁶. Silent lesions disrupt the cortico-striato-pallido-thalamo-cortical pathways and result in depressive symptoms¹²

The cerebral lesions interrupt the projections ascending from midbrain and brainstem, which is passing through thalamus and basal ganglion, and reaching the frontal cortex and reduce the bioavailability of biogenic amines like serotonin (5-HT), dopamine (DA), and norepinephrine (NE) leading to depressive symptoms¹². PSD is additionally related to sort of inflammatory mediator, particular interleukin (IL) - 1 beta, IL-6, IL-8, tumor necrosis factor play a crucial role for development of PSD. Brain derived neurotrophic factor (BDNF), its single nucleotide polymorphism rs1778929 and rs1187323 within the tyrosine receptor kinase B (TrkB) gene of BDNF related to PSD. The serotonin transporter gene (SLC6A4) also play important role in pathophysiology of PSD¹³.

The psychosocial factors mainly include previous history of depression, living alone, social isolation with lack of support and premorbid neuroticism. The stroke related disability may trigger the depression and should reduce patient compliance to rehabilitation treatment and resulting in z In early onset of PSD depressive symptoms tend to be more numerous than psychological symptoms. PSD patient with right hemisphere damage are less likely to present dysphoric depression and more likely to produce vegetative signs and symptoms¹⁴.

The most identifying symptoms are difficulty recalling things, feelings of guilt, feeling of worthlessness, thinking a lot about dying, as potential depressive symptoms. Restless sleep could also be associated with apnea or other sleep disorders common in stroke survivors. Other two recognized symptoms include “not feeling nearly as good as other people” and “not enjoying life” commonly seen in handicap¹⁵.

Depression in stroke cause various health impacts on cognition along with loss of concentration, impairment in new learning skills and motor function deficits collectively termed as depressive-executive dysfunction syndrome (DES)⁶. For the primary time stroke patients experience depression, that is, presence of depressive symptoms but absences of depressive mood. The most manifestations are biologic rhythm disturbances and somatization disorders, especially vegetative vascular dystonia, vertigo and various algic phenomena. These symptoms are common in stroke and depression so it seen in post stroke patients¹⁴.

Diagnosis of PSD

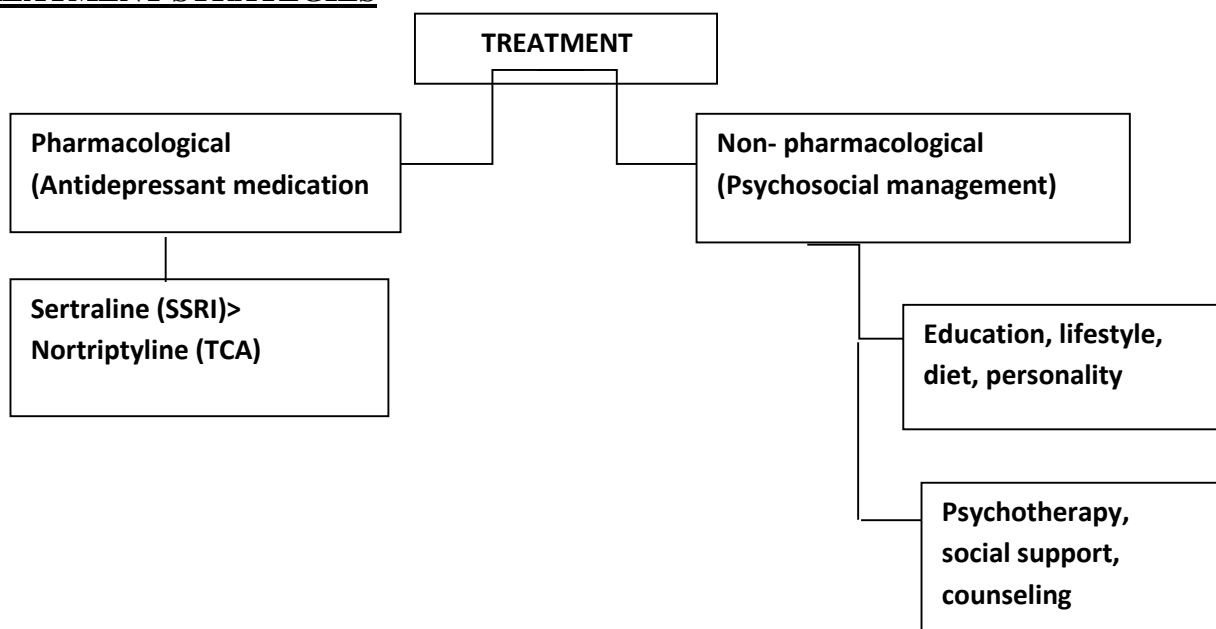
Depression was diagnosed using the Mini International Neuropsychiatric Interview (MINI) (Serbian version/DSM-IV 4.4), it is a short formal interview that is tailored to the diagnosis of depressive disorder in both the DSM-IV and ICD-10 classifications¹⁶. Depression severity was

assessed using the Hamilton Depression Rating Scale (HDRS). Cognitive impairment was assessed by the mini mental scale examination (MMSE). Functional status was expressed using Barthel Index (BI). The Short Form 36 (SF-36) questionnaire was used to assess quality of life six weeks after stroke onset, and the results were analyzed from the perspectives of eight quality of life domains¹⁶

Several diagnostic tools used to assess the PSD, they classified into two types: Self Report and Observer – Rating¹⁷. Some studies stated that Geriatric Depression Scale (GDS) is better than other scales such as Hospital Anxiety and Depression scale (HADS)¹⁴. Post stroke Depression rating scale (PSDRS) is a tool specifically designs for PSD. They then compare the results with Hamilton Depression Scale (Ham-D). Both scales were consider as reliable diagnostic tools for PSD¹⁴

The American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders (4th edn) (DSM IV) categories PSD as a mood disorder resulting from a general medical conditions like stroke¹⁸. Following criteria for diagnosis of depression: depressed mood occurred most of the days, diminished pleasure or interest, weight loss or appetite change, insomnia, loss of energy, recurring thoughts of death, and diminished ability to concentrate, feeling of guilt. Five of these symptoms persist more than 2 weeks consider as patient having depression¹⁸.

TREATMENT STRATEGIES



Depression Screening Tools

- Hamilton depression rating scale: Classifies degree of depression consistent with certain criteria: Score less than 6- without mood swings/normal; from 7-17- slightly depressed; from 18-24 – moderately depressed; above 25- seriously depressed¹⁹
- Nine-item Patient Health Questionnaire²⁰

- The Center of Epidemiological Studies-Depression Scale ²⁰
- Hospital Anxiety and Depression Scale ²⁰
- Beck Depression Inventory ²⁰
- Montgomery-Asberg Depression Scale ²⁰

Pharmacological Therapy

The most commonly used/ first line choice is SSRIs (selective serotonin reuptake inhibitors). The various SSRIs are Citalopram, Fluoxetine, Paroxetine, Sertraline. It works by increasing level of serotonin in brain by blocking the reuptake of serotonin by neurons. A significant improvement in motor functions was seen in patients taking SSRIs; this in turn improves the quality of life in stroke patients. Another type of medication used to treat PSD is SNRIs; however SNRIs should be carefully used because of their side effects (Irritability, insomnia, nausea, and vomiting, cardiovascular responses²¹

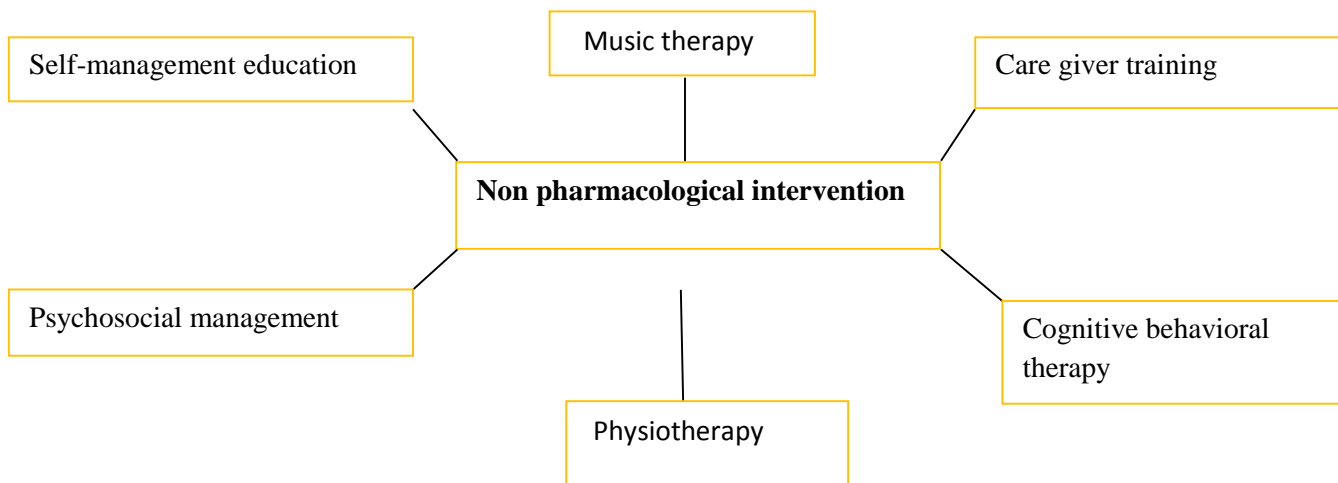
The first antidepressant drug of choice is either nortriptyline or sertraline based on patient compliance. SSRI is superior to TCA because it is safer, has a faster onset of action, and is a strong anxiolytic (7-10 days) which is essential for elderly patient. Nortriptyline (20-100 mg/day) is recommended in the TCA class and sertraline is preferred over citalopram in the SSRI class. In two weeks, sertraline 50 mg/day was increased to 100 mg/day¹⁸

The paroxetine effectively improved the cognitive and functional performance of patients with PSD and also quality of life²². Paroxetine is the potential choice when starting treatment of PSD because it has a good balance between efficacy, acceptability and tolerability²³

The methodology for identifying PSD and evaluating it, as well as the length of antidepressant treatment, were not standardized. While pharmacological treatment improved symptoms, it did not result in remission. In fact data appeared inadequate to support the use ¹⁸

NON PHARMACOLOGICAL MANAGEMENT

A psychotherapeutic intervention is not only costly in terms of staff time and expertise, but it also takes several weeks before any clinical improvements are evident. In a recovery facility with a fixed time limit, this delay may be crucial. Cognitive behavioral therapy is effective in patient with post stroke depression²⁴. Other important non pharmacological treatments are;



1. Care giver training: educate stroke survivors and families about post stroke depression and treatment options, the educational material include 1) signs and symptoms of PSD 2) cause, consequences, timeline of symptoms 3) availability and benefits of treatment for post stroke depression¹⁵.
2. Physiotherapy: PT intervention such as balance exercise, gait training, and fitness training lead to benefit in the disability²⁵
3. Music therapy: help to improve motor function, language and mood²⁵
4. Psychosocial management: management for limited social interaction, poor self esteem, increased disability and less involvement in rehabilitation and failure to work back¹⁸
5. Cognitive behavioral therapy: CBT intervention has positive effects on depressive symptoms in PSD and it is less costly and more effective in terms of quality of life¹⁷.
6. Self management education: capable of influencing social participation, improve their confidence²⁵

Prevention of PSD

The demonstration of preventive care has been a significant move forward in the treatment of PSD²⁶. Post-stroke depression (PSD) causes high morbidity and mortality. Therefore, PSD shows potential candidacy for primary prevention. There are three levels of intervention: global (for the entire stroke population), selective (for stroke patients with high risk), and targeted (for the stroke patients with early signs or symptoms of the disease). Primary intervention for PSD is selective. Primary intervention may include psychological or pharmacological approaches⁶. The pharmacological interventions include SSRIs, tricyclic antidepressants, noradrenaline reuptake inhibitors, monoamine oxidase inhibitors, serotonin-noradrenaline reuptake inhibitors. The

content of the psychotherapy could vary from simple counseling to specific programs helping patients improving their problem solving skills and adjusting to the emotional influence on stroke in daily lives²⁷. PSD has a negative impact on the patient's health. Perhaps the benefit to patients in the acute and sub acute stages of ischaemic stroke would be greater if PSD were given further attention, followed by an effective range and strategy of medication and psychotherapeutic approach²⁸.

CONCLUSION

The World Health Organization now recognizes that depression as one of the most burdensome diseases in worldwide. One fifth of those with stroke reported symptoms consistent with depression in the first year following stroke, which is about 50% higher than the prevalence of symptoms of major or minor depression which is reported in several population-based surveys. According to available facts, PSD is often undertreated. Only 25% of depressed individuals in the present study were taking antidepressants. The importance of a multidisciplinary health team and promise of therapeutic (psychosocial and pharmacological) approaches are promoting broad , well designed multicenter trials to be performed in the homogenous stroke populations in the future to avoid the complications associated PSD.

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