



POST-STROKE DEPRESSION AND ITS IMPACT ON PATIENT REHABILITATION

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Annotation: Post-stroke depression (PSD) is a common neuropsychiatric complication of stroke that may adversely affect patients' psychological well-being, treatment adherence, participation in rehabilitation, and functional recovery. The aim of this study is to investigate the clinical characteristics of post-stroke depression and to evaluate its association with functional recovery and rehabilitation outcomes in stroke patients. Depressive symptoms are assessed using standardized screening instruments, while functional status is evaluated using appropriate clinical outcome measures. Current evidence indicates that post-stroke depression is associated with less favorable functional outcomes, including greater dependence in daily activities and poorer physical and cognitive recovery. Therefore, early identification, regular screening, and comprehensive management of post-stroke depression integrated into the rehabilitation process may play an important role in improving functional recovery and quality of life among stroke survivors.

Keywords: post-stroke depression, stroke, depressive symptoms, functional recovery, neurorehabilitation, functional independence, quality of life, neurological deficit, Barthel Index, modified Rankin Scale, PHQ-9, rehabilitation outcomes.

Аннотация: Постинсультная депрессия (ПСД) является распространённым нейropsychиатрическим осложнением инсульта, которое может негативно влиять на психоэмоциональное состояние пациента, приверженность лечению, активность в процессе реабилитации и функциональное восстановление. Целью настоящего исследования является изучение клинических особенностей постинсультной депрессии и оценка её взаимосвязи с функциональным восстановлением и результатами реабилитации пациентов после инсульта. Предполагается оценка депрессивной симптоматики с использованием стандартизированных шкал, а функционального состояния — с помощью соответствующих клинических критериев. Современные данные свидетельствуют о том, что наличие депрессии после инсульта ассоциируется с менее благоприятными функциональными исходами. В связи с этим раннее выявление депрессии, регулярный скрининг и включение комплексного лечения депрессивных расстройств в программу нейрореабилитации имеют важное значение для улучшения функционального восстановления и качества жизни пациентов.

Ключевые слова: постинсультная депрессия, инсульт, депрессивные симптомы, функциональное восстановление, нейрореабилитация, функциональная независимость, качество жизни, неврологический дефицит, индекс Бартел, модифицированная шкала Рэнкина, PHQ-9, реабилитационные исходы.

Annotatsiya: Insulddan keyingi depressiya (IKD) insulddan so'ng rivojlanadigan keng tarqalgan neyropsixiatrik asorat bo'lib, bemorning psixoemotsional holati, davorlashga rioya

qilishi, rehabilitatsiya jarayonidagi faolligi va funksional tiklanishiga salbiy ta'sir ko'rsatishi mumkin. Mazkur tadqiqotning maqsadi insultdan keyingi depressiyaning klinik xususiyatlarini o'rganish, uning funksional tiklanish va rehabilitatsiya natijalari bilan bog'liqligini baholashdan iborat. Depressiv simptomlarni standartlashtirilgan baholash shkalalari, funksional holatni esa tegishli klinik mezonlar yordamida aniqlash ko'zda tutiladi. Mavjud ilmiy ma'lumotlar depressiya mavjud bo'lgan insult bemorlarida funksional natijalar yomonroq bo'lishi mumkinligini ko'rsatadi. Shu sababli depressiyani erta aniqlash, muntazam skrining qilish va kompleks davolashni rehabilitatsiya dasturiga integratsiya qilish bemorning funksional tiklanishi va hayot sifatini yaxshilashda muhim ahamiyatga ega.

Kalit so'zlar: insultdan keyingi depressiya, insult, depressiv simptomlar, funksional tiklanish, neyrorabilitatsiya, funksional mustaqillik, hayot sifati, nevrologik defitsit, Barthel indeksi, modifikatsiyalangan Rankin shkalasi, PHQ-9, rehabilitatsiya natijalari.

Stroke is one of the most significant neurological disorders in modern medicine and remains a major cause of mortality, disability, and long-term functional limitations worldwide. The post-stroke period is characterized not only by motor, speech, and cognitive impairments but also by substantial changes in the patient's psychological and emotional state. Among these complications, post-stroke depression (PSD) is of particular clinical importance, as it may adversely affect quality of life, social adaptation, adherence to treatment, and active participation in the rehabilitation process.

The pathogenesis of post-stroke depression is complex and multifactorial. It involves not only the anatomical localization of cerebral injury and alterations in neurotransmitter systems but also psychosocial factors associated with stroke, including physical disability, loss of independence, social restrictions, and fear of recurrent stroke. Therefore, PSD should not be regarded merely as a reactive psychological condition but rather as an important clinical component of the post-stroke recovery process.

The presence of depressive symptoms may interfere with a patient's active participation in rehabilitation programs, reduce motivation, decrease adherence to prescribed physical exercises, and potentially slow the expected rate of functional recovery. Consequently, a bidirectional relationship may develop between depression and disability: physical limitations can exacerbate depressive symptoms, while depression may reduce rehabilitation engagement and hinder the restoration of functional independence.

In particular, early identification and systematic assessment of post-stroke depression using standardized screening instruments are of considerable importance in clinical practice. However, depressive symptoms may be difficult to recognize in the presence of motor and cognitive impairments, which can delay timely diagnosis and appropriate intervention. Therefore, comprehensive assessment of depressive symptoms together with neurological and functional parameters may provide a more accurate understanding of the patient's individual rehabilitation needs.

According to the modern concept of neurorehabilitation, successful recovery after stroke should not be assessed solely by the reduction of neurological deficits but also by improvements in functional independence, psychological well-being, and quality of life. Consequently, investigating the impact of post-stroke depression on functional recovery and rehabilitation outcomes represents an important and clinically relevant area of contemporary neurology and rehabilitation medicine.

Therefore, the aim of this study is to investigate the clinical characteristics of post-stroke depression, determine its association with functional recovery and rehabilitation outcomes, and evaluate the importance of early identification of depressive symptoms in improving long-term functional outcomes in stroke survivors.

Post-stroke depression (PSD) is a clinically significant neuropsychiatric complication that may occur at different stages of stroke recovery. Its clinical presentation can include persistent low mood, loss of interest or pleasure, reduced motivation, fatigue, sleep disturbances, changes in appetite, impaired concentration, feelings of hopelessness, and, in severe cases, suicidal ideation. These manifestations may overlap with the neurological consequences of stroke, making the recognition and differential assessment of PSD particularly challenging in clinical practice.

The development of PSD is considered to result from a complex interaction between biological, neurological, and psychosocial mechanisms. Structural brain injury may disrupt neural circuits involved in mood regulation, motivation, cognition, and emotional processing. In addition, alterations in monoaminergic neurotransmission, neuroinflammation, hypothalamic-pituitary-adrenal axis activity, and neuroplasticity may contribute to the development and persistence of depressive symptoms. The anatomical characteristics of the stroke lesion, particularly its location and extent, may also influence the clinical expression of post-stroke mood disorders. Psychosocial factors represent another important component of PSD. Following stroke, patients may experience sudden loss of physical independence, inability to perform previously routine activities, communication difficulties, changes in occupational and social roles, and increased dependence on family members or caregivers. These changes can significantly affect self-esteem and social participation and may contribute to the development or worsening of depressive symptoms. Accordingly, PSD should be considered within a biopsychosocial framework rather than as an isolated psychiatric complication. One of the most clinically important consequences of PSD is its potential negative influence on rehabilitation participation. Successful neurorehabilitation requires regular patient engagement, motivation, active performance of therapeutic exercises, and cooperation with healthcare professionals. Depressive symptoms may reduce motivation and energy, increase perceived effort, and decrease adherence to rehabilitation recommendations. Consequently, patients with clinically significant depressive symptoms may participate less actively in physiotherapy, occupational therapy, speech therapy, and other components of multidisciplinary rehabilitation. The relationship between depression and functional disability may also be bidirectional. Greater neurological impairment and loss of independence can increase the psychological burden associated with stroke, thereby contributing to depressive symptoms. At the same time, depression may reduce participation in rehabilitation and interfere with the acquisition of compensatory strategies and functional skills. This interaction may create a negative cycle in which physical disability contributes to depression, while depression further compromises functional recovery. Functional recovery after stroke is influenced by multiple factors, including initial neurological severity, age, lesion characteristics, cognitive status, comorbidities, complications, rehabilitation intensity, and treatment received during the acute phase. Therefore, assessment of PSD should be integrated with standardized measures of neurological and functional status. The Modified Rankin Scale (mRS) can be used to assess the degree of global disability and dependence, while the Barthel Index provides

information regarding independence in activities of daily living. Combining these measures with a validated depression screening instrument allows a more comprehensive evaluation of the relationship between psychological status and functional recovery.

Several standardized instruments may be used for the assessment of depressive symptoms following stroke. The Patient Health Questionnaire-9 (PHQ-9) is widely used because it evaluates the severity of depressive symptoms and can be applied repeatedly during follow-up. The Hospital Anxiety and Depression Scale (HADS) may also be useful in neurological and rehabilitation settings, particularly when somatic symptoms could overlap with manifestations of stroke. However, screening results should be interpreted within the clinical context, and a positive screening result should lead to further clinical assessment rather than being considered equivalent to a definitive psychiatric diagnosis. The timing of depression assessment is also important. Depressive symptoms may emerge during the acute phase but can also develop or become more prominent during the subacute and chronic stages of recovery. Regular assessment throughout rehabilitation may therefore be more informative than a single evaluation. Monitoring changes in depressive symptoms over time can help clinicians identify patients who require additional psychological or psychiatric intervention and determine whether treatment is associated with improved participation in rehabilitation. Early recognition and appropriate management of PSD should form an integral part of multidisciplinary stroke care. Pharmacological treatment may be indicated in selected patients, while psychological interventions, structured rehabilitation, social support, patient education, and family involvement can provide additional benefits. A multidisciplinary approach involving neurologists, psychiatrists, psychologists, rehabilitation physicians, physiotherapists, occupational therapists, speech and language therapists, nurses, and caregivers may improve continuity of care and address the multiple dimensions of post-stroke disability. Importantly, the presence of depressive symptoms should not be interpreted as an indication of poor recovery in every individual patient. Functional outcomes are determined by a combination of neurological, biological, psychological, and social factors. Nevertheless, identifying depression as a potentially modifiable factor provides an important opportunity to optimize rehabilitation. Early intervention may improve motivation, treatment adherence, participation in therapeutic activities, and overall quality of life. From a clinical perspective, systematic screening for PSD should therefore be incorporated into routine post-stroke assessment, particularly in patients demonstrating reduced motivation, limited participation in rehabilitation, unexplained fatigue, social withdrawal, persistent sleep disturbances, or deterioration in functional performance. Combining psychological assessment with objective measures of neurological impairment and functional independence may allow clinicians to identify patients at increased risk of unfavorable rehabilitation outcomes. Overall, post-stroke depression should be regarded as an important and potentially modifiable determinant of recovery rather than as a secondary psychological consequence of stroke. A comprehensive assessment that integrates depressive symptoms, neurological status, functional independence, cognitive performance, and rehabilitation participation may provide a more accurate understanding of individual recovery trajectories. Such an approach may contribute to earlier intervention, more personalized rehabilitation planning, and improved long-term functional and psychosocial outcomes in stroke survivors.

Post-stroke depression is an important and potentially modifiable complication that can substantially influence the course and effectiveness of stroke rehabilitation. Its impact extends beyond psychological well-being, affecting motivation, treatment adherence, participation in rehabilitation activities, functional independence, and overall quality of life. The relationship between depressive symptoms and functional disability appears to be bidirectional, as neurological impairment and loss of independence may contribute to depression, while depression may further hinder the process of functional recovery.

Early identification of depressive symptoms through standardized screening and comprehensive clinical assessment should therefore be considered an integral component of post-stroke care. Combining assessment of depression with objective measures of neurological impairment and functional status, such as the PHQ-9, HADS, Barthel Index, and Modified Rankin Scale, may provide a more comprehensive understanding of the patient's recovery trajectory. A multidisciplinary approach involving neurologists, rehabilitation specialists, psychologists, psychiatrists, physiotherapists, occupational therapists, speech and language therapists, nurses, and caregivers is essential for addressing both the neurological and psychological consequences of stroke. Timely recognition and appropriate management of post-stroke depression may enhance rehabilitation participation, support functional independence, improve quality of life, and contribute to more favorable long-term outcomes. Thus, post-stroke depression should be regarded not merely as a psychological consequence of stroke, but as an important clinical factor that can influence the effectiveness of neurorehabilitation and the overall recovery process. Early diagnosis, individualized treatment, continuous monitoring, and integration of psychological care into comprehensive rehabilitation programs represent important strategies for optimizing functional recovery in stroke survivors.

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