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Nursing Care and Monitoring neurological signs in Acute Brain Stroke

[1] -Aisha Raffas AL-daffery,[2] Heba Mohammed ALshammiri,[3]Tahani Mahel AL-rawwli,[4]Bazah Wakeer AL-daffery,[5]Reem Obeid AL-daffery,[6]Wadah Mubark AL-Mutery,[7] Abadallah AL-Harbi,[8]Najawa Maleh AL-daffery,[9]Mashael Dhaher AL-Anizi,.[10]-Salma Aish Al-Anizi,[11]Haya Abdallah Al-Khaibry,[12]Dalal Qharbi Hawas Al-shammery,[13]Nahed Qharbi Hawas Al-shammery,[14]Eman Nahar Marfua Al-shammery,[15]Amal Nahar Marfua Al-shammery,[16] Fawaz Battah Alshammari,[17]mashel thani Alshammri,[18]Abdulaziz ghatheth nasser Almutairi,

[1]Maternity and Children's Hospital in Hafr Al-Batin.

[2]Maternity and Children's Hospital in Hafr Al-Batin.

[3]Maternity and Children's Hospital in Hafr Al-Batin.

[4]Maternity and Children's Hospital in Hafr Al-Batin.

[5]Maternity and Children's Hospital in Hafr Al-Batin.

-[6]Maternity and Children Hospital in Hafr Al-Batin

[7]Maternity and Children Hospital in Hafr Al-Batin

[8]Maternity and Children Hospital in Hafr Al-Batin

[9]Maternity and Children Hospital in Hafr Al-Batin

[10]Maternity and Children's Hospital in Hafr Al-Batin.

[11]Maternity and Children's Hospital in Hafr Al-Batin .

[12]Maternity and Children Hospital in Hafr Al-Batin

[13]Mohammedia clinic in Hafr Al-Batin

[14]Maternity and Children Hospital in Hafr Al-Batin

[15]Ministry of Health Branch - Hafr Al-Batin Health

[16]Maternity and Children Hospital

[17]Maternity and Children Hospital

[18]Maternity and Children Hospital

Abstract:

Background: Stroke is a leading cause of mortality and disability worldwide. It occurs when blood flow to part of the brain is interrupted, causing tissue damage and neurological deficits. Acute brain stroke is categorized into ischemic and hemorrhagic types, with ischemic stroke being the most prevalent. Rapid recognition and prompt intervention are crucial in minimizing brain damage and improving outcomes. Acute stroke care, particularly nursing management, plays a critical role in improving recovery and preventing complications.

Aim: This study explores the importance of nursing care and monitoring neurological signs in patients with acute brain stroke, emphasizing timely interventions to enhance recovery and minimize long-term disability.

Methods: This article reviews literature on the management of acute brain stroke in both prehospital and hospital settings. It discusses the role of nursing in stroke care, the use of stroke units, blood pressure monitoring, and the management of reperfusion therapy. Key methods include early stroke recognition, use of thrombolytic therapy and mechanical thrombectomy for ischemic stroke, and specialized nursing care in stroke units.

Results: Stroke units with specialized nursing care have demonstrated improved outcomes, including reduced mortality and recurrence rates. Early management using intravenous thrombolysis and mechanical thrombectomy significantly enhances recovery in ischemic stroke patients. Blood pressure management, particularly in patients undergoing reperfusion therapy, is critical in preventing complications such as hemorrhagic transformation and worsening ischemic injury.

Conclusion: Timely intervention and comprehensive nursing care in acute brain stroke management are essential for improving patient outcomes. Specialized stroke units and early recognition of stroke symptoms are critical for enhancing the quality of care. Nurses play a vital role in monitoring vital signs, managing blood pressure, and ensuring the effectiveness of reperfusion therapies, thus contributing to better functional outcomes and reducing the burden of stroke.

Key Words: Acute brain stroke, ischemic stroke, hemorrhagic stroke, nursing care, stroke units, neurological monitoring, reperfusion therapy, blood pressure management.

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Introduction:

Stroke is the foremost cause of significant disability in adults and is the top cause of mortality in women and the second greatest cause in men in Spain [1]. Although stroke is an abrupt and life-threatening disorder, it is preventable, treatable, and, in certain instances, reversible. Acute stroke management entails therapeutic approaches that, when applied promptly, markedly improve functional results. Ischemic stroke, accounting for 80-85% of all stroke instances, is treated effectively with reperfusion treatments, including intravenous thrombolysis (IVT) and mechanical thrombectomy, both of which have demonstrated safety and efficacy (level of evidence 1, grade of recommendation A). These treatments are significantly time-sensitive. Moreover, stroke units and multidisciplinary treatment plans are essential in decreasing morbidity and death associated with all stroke types [4].

Acute Brain Stroke:

Acute brain stroke, also known as cerebrovascular accident (CVA), is a critical medical emergency that occurs when the blood supply to part of the brain is interrupted, leading to oxygen deprivation and potential brain cell death. Stroke is one of the leading causes of morbidity and mortality worldwide, with substantial implications for both individual patients and healthcare systems. It is categorized into two main types: ischemic and hemorrhagic stroke. Ischemic stroke, which accounts for approximately 85% of all stroke cases, occurs when a blood clot or plaque obstructs a blood vessel supplying the brain. The obstruction leads to a reduction in blood flow, causing ischemia in the affected brain region. The most common causes of ischemic stroke are atherosclerosis, embolism (where a clot forms elsewhere in the body, often in the heart, and travels to the brain), and thrombosis (formation of a clot within the cerebral arteries). The resulting tissue damage can lead to significant neurological deficits, depending on the area of the brain affected. Hemorrhagic stroke, accounting for about 15% of strokes, occurs when a blood vessel in the brain ruptures, leading to bleeding within the brain. This type of stroke is typically caused by the rupture of aneurysms, arteriovenous malformations (AVMs), or as a consequence of hypertension, which weakens the blood vessel walls. Hemorrhagic strokes may lead to increased intracranial pressure and result in severe complications, including brain herniation and death if not treated promptly [4].

Pathophysiology of Acute Stroke

The pathophysiology of stroke involves complex mechanisms related to the disruption of blood flow to the brain. In the case of ischemic stroke, the occlusion of blood vessels results in a cascade of biochemical events, including the release of excitatory neurotransmitters, activation of inflammatory processes, and the production of free radicals. This cascade leads to neuronal injury, apoptosis, and infarction in the affected area. In hemorrhagic stroke, blood leaking into the brain can lead to the displacement of brain tissue, damage to nearby blood vessels, and the formation of a hematoma, further exacerbating tissue injury and increasing intracranial pressure.

Symptoms and Diagnosis

The clinical presentation of acute brain stroke depends on the region of the brain affected. Common symptoms include sudden-onset weakness or numbness of the face, arm, or leg (typically on one side of the body), difficulty speaking or understanding speech (aphasia), vision disturbances, dizziness, and loss of coordination or balance. The recognition of these symptoms is critical for timely intervention. Diagnosis is typically based on a combination of clinical evaluation and imaging techniques, such as computed tomography (CT) or magnetic resonance imaging (MRI). These imaging modalities help to differentiate between ischemic and hemorrhagic strokes, assess the extent of brain damage, and guide treatment decisions [4].

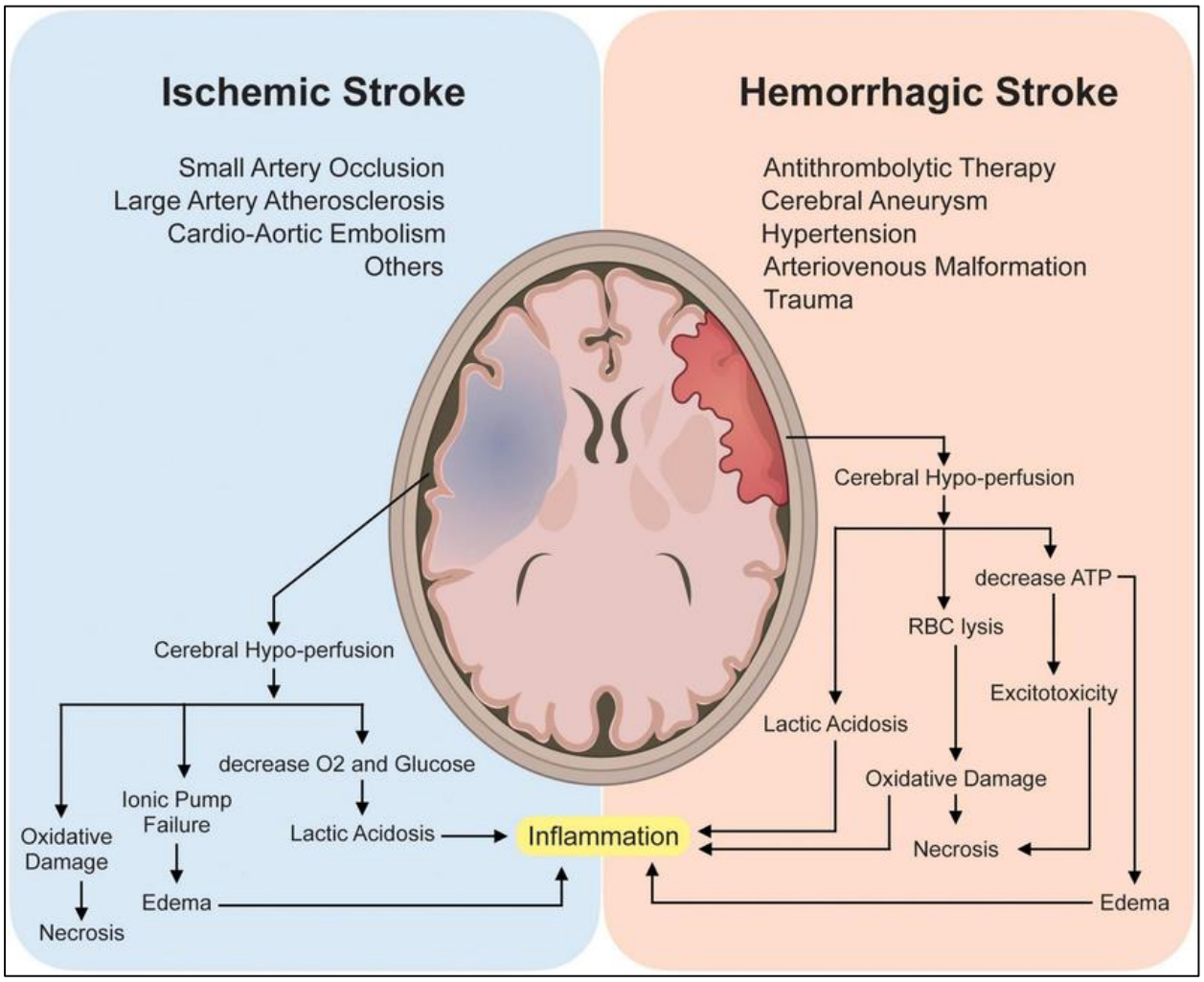

Figure 1: Pathophysiology of Brain Stroke (Ischemic and Hemorrhagic).

Treatment and Management

Early recognition and intervention are crucial in stroke management. For ischemic strokes, the primary goal is to restore blood flow to the affected brain region. This is typically achieved through thrombolytic therapy (administering clot-busting drugs like tissue plasminogen activator, tPA) or mechanical thrombectomy (physically removing the clot). In hemorrhagic stroke, the focus is on controlling bleeding, reducing intracranial pressure, and managing the underlying cause of the hemorrhage, such as surgical intervention for aneurysms or AVMs. Secondary prevention is essential to reduce the risk of recurrent strokes. This involves managing risk factors such as hypertension, diabetes, hyperlipidemia, and smoking, as well as antiplatelet therapy, anticoagulants, and lifestyle modifications. Acute brain stroke is a medical emergency with serious consequences, requiring immediate intervention to minimize brain damage and improve outcomes. Ischemic and hemorrhagic strokes each present distinct challenges in terms of pathophysiology, diagnosis, and treatment, yet timely management can significantly impact recovery. Continued advancements in stroke care, early recognition of symptoms, and prevention strategies are crucial in reducing the global burden of stroke and improving the quality of life for survivors [4].

Prehospital Setting

The preliminary stage of stroke management necessitates swift and precise identification of symptoms by prehospital care teams. Upon suspicion of an acute stroke, the "code stroke" protocol should be initiated. Code stroke is an emergency strategy aimed at accelerating patient access to reperfusion treatments. This underscores the necessity of a robust stroke care network that guarantees patients are directed to the most suitable facility according to the severity of their illness, promoting coordination among diverse hospitals and prehospital emergency services. Numerous approved instruments facilitate the identification and evaluation of stroke severity in the prehospital context. The Cincinnati Prehospital Stroke Scale is an efficient and direct tool for identifying three hallmark indicators of stroke [6]. The Rapid Arterial Occlusion Evaluation (RACE) scale, which exhibits great sensitivity for detecting large-vessel arterial occlusions in patients scoring over 4 points, aids in assessing eligibility for endovascular intervention [7]. Innovative technology have enhanced communication between emergency teams and hospitals, facilitating advance notifications of patient referrals, anticipated arrival times, and clinical attributes. Telemedicine initiatives, like telestroke, provide the remote delivery of intravenous thrombolysis in local hospitals, supervised by vascular neurologists from tertiary care facilities. This facilitates a smooth transition of patients for evaluation of the necessity of mechanical thrombectomy or specialized stroke treatment. The discussion over the most efficient patient referral mechanism remains inconclusive. Two methods are presently employed: the "drip-and-ship" model emphasizes thrombolysis and advises moving the patient to the nearest primary care facility, whereas the "mothership" model entails prompt transfer to a tertiary care center for comprehensive stroke management. There is inadequate evidence to definitively ascertain which paradigm provides superior therapeutic outcomes. Current study may yield insights for enhancing care pathways for coding stroke [5].

Hospital Setting

Upon hospital admission, patients suspected of a stroke often receive prompt assessment in the emergency department, ideally conducted by a vascular neurologist [8]. A non-contrast brain CT scan is conducted rapidly, facilitating the detection of cerebral hemorrhage and the diagnosis of ischemic stroke. This diagnostic method assesses the patient's eligibility for IVT. Numerous hospitals utilize multimodal CT scans, encompassing angiography and perfusion tests, to provide supplementary diagnostic information, particularly for cases with ambiguous symptom start or those necessitating thrombectomy [9]. The participation of expert stroke teams in the CT or angiography suite is essential for minimizing treatment delays [10, 11]. In institutions with an organizational structure that facilitates the integration of a stroke nurse into the team, the nurse escorts the patient from the emergency department to the CT room, collecting vital clinical data during the transfer. Preliminary evaluations, encompassing glucose and blood pressure stabilization, are performed, and a peripheral venous catheter is placed for laboratory analyses (full blood count, biochemistry, and coagulation testing). If IVT is not contraindicated, it commences after

the CT scan, with a dosage according to the patient's weight. In instances of cerebral artery obstruction, multimodal neuroimaging informs judgments about endovascular reperfusion therapy, usually conducted via femoral artery access to extract the thrombus.

Occasionally, supplementary techniques like intra-arterial fibrinolysis or balloon angioplasty may be utilized, sometimes in conjunction with stent implantation. In Catalonia, approximately 33% of patients with acute ischemic stroke are administered fibrinolysis, 20% have thrombectomy, and 8% receive both interventions [12]. The principal constraints of intravenous thrombolysis (IVT) encompass a limited therapeutic window, diminished effectiveness in large-vessel occlusions (e.g., internal carotid artery, middle cerebral artery), and contraindications for patients with an elevated risk of hemorrhagic complications, including those with recent surgical procedures or a history of anticoagulation therapy. Symptomatic intracerebral hemorrhage (ICH), occurring in 2-11% of patients, represents the most severe complication of intravenous thrombolysis (IVT), alongside other potential complications such as systemic bleeding and allergic responses (1.3%–5.1%). [2]. Endovascular operations, although typically more intricate, are conducted in tertiary stroke hospitals and achieve a 90% recanalization success rate. Nonetheless, positive radiological outcomes may not invariably correspond to advantageous clinical consequences, especially when recanalization fails to facilitate functional recovery (futile recanalization). Risks linked to endovascular treatment encompass symptomatic intracerebral hemorrhage (3% of cases), embolization to new areas (5%-8%), arterial dissection (1%-4%), and arterial perforation (0.6%-5%) [3].

Admission to a Stroke Unit

Following initial therapies, admission to a specialized stroke unit is essential for continued care. Stroke units are specialized locations that offer continuous, non-invasive monitoring and are staffed by a multidisciplinary team coordinated by neurologists. These units have demonstrated the highest efficacy in stroke care, resulting in a 17% reduction in mortality, a 25% decrease in recurrence, and a 25% decline in reliance rates (class I, level of evidence A) [4]. The advantages of stroke units frequently surpass those of reperfusion therapies, as a greater number of patients obtain specialist care, hence aiding in the reduction of hospital stays and readmission rates. Stroke units represent a cost-efficient approach, enhancing therapeutic outcomes for various stroke subtypes and severities, with the significant exception of patients exhibiting extremely low levels of consciousness, who are more appropriately managed in intensive care units. The duration of hospitalization depends on patient characteristics and stroke subtype; nonetheless, admission to a stroke unit is advised for all patients with acute stroke due to its proven benefits in outcomes [13].

Nursing Care in the Stroke Unit

Nursing care in stroke units is essential for the efficient management of stroke patients. Stroke units should ideally employ specialized nurses in stroke care, maintaining a nurse-to-bed ratio of 1:2 (semi-intensive care) as suggested by the European Stroke Organisation. In numerous contexts, ratios of 1:4 or 1:6 are deemed acceptable, contingent upon the seriousness of the instances being addressed [15]. The principal emphasis of care in stroke units is the management of patients according to established procedures aimed at preventing complications, facilitating early detection, and administering suitable therapies or interventions. Blood pressure monitoring is a crucial component of nursing care in stroke units, given the prevalence of hypertension in stroke patients. Elevated blood pressure can be attributed to the stroke, pre-existing hypertension, stress, pain, and physiological reactions to hypoxia. Effective regulation of blood pressure is essential as it mitigates cerebral edema and the likelihood of hemorrhagic transformation. It is crucial to prevent significant drop in blood pressure, as it may impair perfusion in the penumbra and worsen ischemic injury. Hypertension often resolves spontaneously, but hypotension is less common; however, when it does occur, the underlying reason must be recognized and rectified. The ideal blood pressure objectives during the acute period of stroke continue to be contentious, with differing guidelines providing recommendations for blood pressure management in stroke patients [9, 15, 16].

Monitoring blood pressure in patients undergoing reperfusion therapy is essential, particularly in the initial hours post-intervention, due to the danger of hemorrhagic change. A standard monitoring

protocol may consist of measuring blood pressure every 15 minutes for the initial 2 hours, every 30 minutes for the subsequent 6 hours, and then hourly for the next 24 hours or until a follow-up CT scan is performed. In patients with acute intracranial hemorrhage (ICH), it is advisable to lower systolic blood pressure to 140 mm Hg if it ranges from 150 to 220 mm Hg, assuming no contraindications for antihypertensive therapy exist. This acute blood pressure reduction method has demonstrated efficacy in preventing the progression of intracerebral hemorrhage and may enhance functional outcomes [17, 18].

Blood Pressure Targets Based on Stroke Subtype and Treatment Received

Blood pressure control differs based on the stroke type and the administered medication. In acute ischemic stroke, treatment should commence if blood pressure above 220/120 mm Hg, aiming to decrease it by 15% within the initial 24 hours. This is designated as a Class IIb recommendation supported by level C evidence [9]. In ischemic stroke patients receiving reperfusion therapy, blood pressure must be sustained below 185/110 mm Hg prior to reperfusion and below 180/105 mm Hg post-procedure. These suggestions are substantiated by Class I, level B evidence [9]. In patients with hemorrhagic stroke, it is recommended to maintain systolic blood pressure at or below 140 mm Hg to avert additional brain tissue damage, supported by a Class I, level B recommendation [17, 18]. The nursing care administered in stroke units must be meticulously monitored to guarantee excellent patient outcomes. Specialized nursing care, prompt monitoring of vital signs, and compliance with blood pressure management procedures are crucial for reducing consequences such as cerebral edema, hemorrhagic transformation, and ischemic advancement. Continuous monitoring and modification of blood pressure, especially in the initial hours post-reperfusion therapy, are essential for enhancing the prognosis of stroke patients. Implementing these evidence-based recommendations can markedly decrease morbidity, death, and long-term disability related to stroke.

Approach to Blood Pressure Reduction and Additional Stroke Care Considerations

The preferred method for lowering blood pressure in stroke patients is the intravenous infusion of short-acting antihypertensive agents such labetalol or urapidil. These drugs may be delivered as a bolus or as continuous infusion, customized to the specific requirements of the patient. This strategy seeks to manage hypertension efficiently while reducing the risks of hemorrhagic transformation or exacerbated ischemia. In the initial period after a stroke, considerable complications are often noted. Approximately 20% to 50% of patients exhibit body temperatures exceeding 37.5°C, up to 50% develop hyperglycemia, and between 37% and 78% manifest dysphagia. These disorders are recognized to increase both morbidity and death rates in stroke patients [19]. Fever, especially when it manifests within the initial 24 hours post-stroke, correlates with a two-fold elevation in the risk of early mortality [20]. To alleviate this danger, fever should be promptly addressed with antipyretics such paracetamol, and all potential sources of infection must be meticulously examined. Nurses must maintain vigilance to avert healthcare-associated infections by following stringent cleanliness measures, especially prior to catheter operations, the removal of superfluous devices, and the management of dysphagia. Empiric antibiotic therapy should be contemplated just in the presence of infection indicators [9].

Glycemic Control and Dysphagia Management

Stringent glycemic regulation is crucial in stroke therapy. Hypoglycemia may exhibit symptoms resembling an ischemic stroke and necessitates prompt intervention. Conversely, hyperglycemia constitutes an independent risk factor for worse prognosis. Chronic hyperglycemia within 24 hours following a stroke is associated with poorer outcomes, necessitating the maintenance of blood glucose levels below 180 mg/dL. This necessitates ongoing surveillance and immediate intervention to prevent hyperglycemia and hypoglycemia [21]. Dysphagia is a common consequence following a stroke. Timely recognition of dysphagia is essential to avert aspiration and guarantee safe swallowing. Dysphagia screening must occur prior to the administration of any oral medication or nutrition, and the assessment should be re-evaluated if the patient's clinical status alters. Numerous dysphagia screening assessments are available, although data has not yet established the superiority of one over the others. In our context, the water swallow test and the volume-viscosity swallow test are the most often employed assessments.

Effective management of dysphagia is crucial for preserving hydration and nutrition while reducing the risks of aspiration.

FeSS Nursing Protocol for Acute Stroke Care

The "FeSS" (Fever, Sugar, Swallowing) nursing care routine has demonstrated a 16% reduction in stroke-related mortality and dependence, with these improvements maintained over time [19]. The FeSS protocol entails the methodical treatment of three essential factors: fever, blood glucose, and swallowing capability. The guideline underscores the prompt delivery of antipyretics for temperatures exceeding 37.5°C, insulin for blood glucose levels surpassing 180 mg/dL, and dysphagia screening within 24 hours after stroke started. In instances with significant dysphagia, it is advisable to visit a speech therapist.

Recommendations and Evidence for Nursing Care

Alongside the FeSS protocol, other nursing care guidelines seek to avert problems in acute stroke patients and enhance long-term results. These suggestions encompass a spectrum of therapies, including infection prevention, temperature regulation, and blood glucose management, each substantiated by differing degrees of evidence. The levels of evidence for the nursing care recommendations, emphasizing the strength of the research underpinning best practices for acute stroke management [5, 9, 15, 16, 22, 23, 24, 25, 26, 27, 28]. Nursing treatment for stroke patients in acute situations necessitates meticulous consideration of several physiological and safety factors. The administration of positional, cardiac, respiratory, and bladder functions, together with methods to avert problems and facilitate early rehabilitation, is essential for patient recovery and results. Concerning head positioning, although the advantages of lying flat (fully supine) or elevating the head to a minimum of 30° are not distinctly established, a fully supine posture may improve cerebral perfusion in patients with hyperacute stroke, potentially providing benefits without heightening the risk of respiratory infection. This position must be sustained for the initial 24 hours or until the patient attains hemodynamic stabilization [9, 24]. Cardiac function is a critical domain, necessitating electrocardiography at admission, with continuous monitoring advised to identify atrial fibrillation and other arrhythmias that may require emergency intervention [9]. Cardiac monitoring must persist for a minimum of 24 hours, and echocardiography may be contemplated for patients suspected of experiencing a cardioembolic stroke [9]. The information does not definitively support the routine deployment of Holter monitoring [9].

Pulse oximetry should be conducted every 4 hours to assess oxygen saturation levels, with oxygen therapy provided as required for respiratory management. Routine oxygen therapy is contraindicated unless deemed necessary for the patient. Oxygen saturation targets should range from 94-98% for patients without respiratory conditions, and from 88-92% for individuals at risk of hypercapnic respiratory failure [25]. urine catheterization should be circumvented except in instances of acute urine retention or when stringent diuresis management is required, as in situations of heart failure. Furthermore, all patients must be evaluated for urine incontinence, bowel incontinence, and constipation, and preventive strategies should be implemented [9, 15]. Safety practices must incorporate steps to avert falls or injuries, guaranteeing the presence of handrails and other requisite support structures. Early mobilization, must be evaluated within 48 hours of admission, is crucial; after 24 hours, a multidisciplinary team must examine the patient's stability for seated positioning. Ultra-early mobilization (prior to 24 hours post-stroke) should be eschewed, as it has been demonstrated to adversely impact recovery [9, 26]. Neurological assessments are essential for monitoring patient advancement. Assessment tools like the National Institutes of Health Stroke Scale (NIHSS) and the Canadian Neurological Scale (CNS) must be utilized to identify any neurological gains or deteriorations, with evaluations conducted consistently within the initial 72 hours post-stroke [15, 16]. In the event of observed worsening, an emergency head CT scan should be contemplated [15, 16].

Preventing deep vein thrombosis (DVT) is essential for immobile patients, with prophylaxis of low-molecular-weight heparin commenced within 24-48 hours of symptom onset, barring contraindications. In instances when antithrombotics are contraindicated, intermittent pneumatic compression devices should be utilized [27]. Post-stroke depression must be assessed utilizing approved instruments, followed by suitable therapy interventions [9, 15]. It is advisable to implement rigorous oral hygiene practices to

mitigate the risk of aspiration pneumonia, and pressure-relief mattresses and cushions should be utilized until the patient recovers mobility [5]. A customized nutrition plan is crucial, especially for individuals with dysphagia, to guarantee adequate hydration and nutrients. In cases of severe dysphagia, a nasogastric tube must be inserted promptly upon admission or within 72 hours post-stroke to facilitate nutritional intake [15]. Monitoring fluid balance is recommended, particularly within the initial 24 hours and for patients with cardiac or renal failure, to preserve electrolyte equilibrium [22, 27]. Furthermore, in patients undergoing endovascular operations, the puncture site must be observed for possible consequences, including bleeding, hematoma, or more severe situations such as critical limb ischemia and retroperitoneal hemorrhage [29]. When regularly and rigorously applied, these principles establish a comprehensive framework for acute stroke care, with the objectives of reducing mortality, preventing complications, and enhancing overall patient recovery.

Hospital Discharge Following Stroke

The determination to discharge a patient post-stroke is generally made after the acute phase has resolved, indicating that inpatient care and intense follow-up are no longer necessary. Upon discharge, patients are frequently prescribed secondary preventive efforts, including rehabilitation programs, informed by the results of a thorough etiological study. Patient education and counseling are essential elements of this process, designed to foster independence and guarantee that relatives or primary caregivers are actively engaged in the patient's continuous care. The attending physician must furnish comprehensive details regarding the stroke, prognostic recovery outcomes, and accessible resources, including stroke support organizations, to ensure a seamless transition from hospital to home [14]. Hospitalization educational programs have demonstrated efficacy in improving patient and family comprehension of the disease, facilitating their navigation of the recovery process. These programs, potentially encompassing group sessions, enhance communication between healthcare providers and family, hence augmenting patient satisfaction with the care received [30]. This instructional method is essential for ensuring that patients and their families are adequately informed and prepared to handle ongoing care requirements post-discharge.

The coordination of care is crucial throughout the discharge period. The discharge report must thoroughly detail the patient's condition, encompassing the degree of functional limitations, stroke severity, and prognosis, alongside comprehensive information on pharmacological interventions, specific nursing care requirements (including urinary catheter management, pressure ulcer prevention, mobilization needs, and nutritional requirements), and the rehabilitation strategy. Patients should be urged to visit their primary care physician for an initial clinical evaluation. The primary care physician is essential in evaluating the treatments administered—both stroke-related and other interventions—reassessing secondary prevention objectives, ensuring patient comprehension of the prescribed therapies, monitoring for adverse drug reactions, and overseeing adherence to the treatment regimen. Additionally, they may customize a personalized treatment and rehabilitation plan, which can be administered at home or in an outpatient environment, contingent upon the patient's neurological sequelae and problems [31]. Neurorehabilitation is an essential component of the healing process, providing the sole possibility for enhancement for patients with lingering deficits after a stroke. Recent advancements have underscored the significance of trained nursing personnel in stroke management, especially during the acute period and subsequent follow-up. The changing function of these trained nurses is promising, with the capacity to revolutionize nursing care paradigms and improve patient outcomes in both hospital and post-hospital environments. This transition to more individualized and holistic care models may provide substantial enhancements in the long-term rehabilitation of stroke patients [32].

Future Trends in Nursing Care:

Acute brain stroke remains one of the leading causes of death and disability worldwide, necessitating timely and effective nursing care. The rapid advancements in medical technology, clinical research, and interdisciplinary collaboration continue to shape the future trends in nursing care for stroke patients. As the role of nurses in managing acute stroke evolves, several key areas will be critical in

improving patient outcomes, especially the use of monitoring tools such as the Glasgow Coma Scale (GCS). The GCS, which assesses the level of consciousness and neurological function, will play a pivotal role in guiding nursing interventions, influencing decisions related to treatment, rehabilitation, and patient monitoring.

Personalized and Targeted Nursing Interventions

One of the major trends in nursing care for acute stroke is the shift towards personalized and targeted care plans. Nurses will increasingly be involved in tailoring interventions based on the individual patient's needs, including factors such as age, comorbidities, stroke type, and response to initial treatment. Personalized care plans may involve adjustments in stroke protocols, nutritional requirements, rehabilitation strategies, and pharmacological management. The ability to assess stroke severity and prognosis through precise monitoring tools, including the GCS, will be central to the creation of these individualized care plans. For example, the GCS can assist nurses in determining the severity of a patient's neurological condition by measuring their level of consciousness. The scale ranges from 3 to 15, with scores indicating the patient's response to stimuli such as eye opening, verbal responses, and motor activity. Continuous monitoring of GCS scores during the acute phase of stroke will guide nursing staff in determining the progression or improvement of the patient's neurological status, helping to adjust care interventions accordingly. This trend aligns with the growing emphasis on early intervention and rapid response to stroke symptoms, a critical factor in improving long-term recovery outcomes.

Advanced Monitoring Technologies

Technological advancements are rapidly transforming stroke care, and nurses are expected to become more proficient in the use of sophisticated monitoring devices. The integration of advanced monitoring technologies, such as wearable sensors, continuous electroencephalography (EEG), and brain imaging tools, will enable real-time tracking of patient status and provide vital data for decision-making. These technologies will complement traditional monitoring practices, including the GCS, by offering additional insights into brain function, cerebral oxygenation, and other critical parameters. For instance, wearable devices that monitor vital signs like blood pressure, heart rate, oxygen saturation, and respiratory rate can help nurses assess the patient's general condition and intervene earlier if any abnormalities arise. The use of telemetry to continuously monitor the GCS score along with these vital parameters can facilitate more timely and accurate responses to changes in a patient's condition, enhancing patient safety and outcomes. Nurses will increasingly be expected to integrate data from multiple sources, interpret it in real-time, and make informed decisions about the patient's care plan, all while maintaining a holistic view of the patient's needs.

Enhanced Stroke Rehabilitation Through Telemedicine

As the role of nurses expands beyond the acute phase, the future of stroke rehabilitation will increasingly incorporate telemedicine and remote monitoring technologies. Stroke rehabilitation, which involves both physical and cognitive recovery, is a prolonged process that requires ongoing support and monitoring. Telemedicine offers the potential to bridge gaps in care, particularly for patients who live in rural or underserved areas. Nurses, in collaboration with other healthcare professionals, will play an integral role in providing tele-rehabilitation services, monitoring patient progress through virtual consultations, and providing educational resources to patients and their families. The integration of telemedicine in stroke rehabilitation programs will be facilitated by continuous monitoring tools, including the GCS, that allow healthcare providers to remotely assess neurological status and track recovery. For example, through virtual assessments and telemonitoring of GCS scores, nurses can identify early signs of deterioration or complications and initiate prompt interventions. This approach will enhance accessibility to care, increase patient engagement, and provide consistent monitoring of the recovery process, all of which are essential for optimal stroke rehabilitation.

Artificial Intelligence and Machine Learning in Stroke Care

Another transformative trend in stroke nursing care is the incorporation of artificial intelligence (AI) and machine learning (ML) into clinical decision-making. AI algorithms have the potential to analyze vast amounts of clinical data to predict outcomes, personalize treatment plans, and assist in early diagnosis. These technologies could revolutionize the way stroke patients are monitored and treated, with AI-driven systems providing real-time analysis of GCS scores, vital signs, and imaging results. For instance, AI algorithms could continuously track a patient's neurological status, alerting nursing staff to any significant changes in GCS scores or other clinical parameters that may indicate deteriorating conditions such as brain herniation or increased intracranial pressure. These algorithms can also predict potential complications such as stroke recurrence or adverse effects of medications, helping nurses to proactively address issues before they escalate. As AI and ML technologies become more integrated into stroke care, nurses will need to become proficient in interpreting AI-generated insights and integrating them into their clinical practice.

Interdisciplinary Collaboration and Holistic Patient Care

The future of stroke care will see an increased emphasis on interdisciplinary collaboration, with nurses working closely alongside physicians, neurologists, physiotherapists, speech therapists, and other healthcare professionals. Effective communication and coordination among the healthcare team will be essential for ensuring that stroke patients receive comprehensive, well-rounded care throughout their hospitalization and rehabilitation. The GCS will continue to serve as a vital tool for interdisciplinary communication, as it provides a standardized and objective measure of a patient's neurological status. Nurses will be responsible for consistently monitoring and documenting the GCS scores, and their observations will be crucial in shaping the care plans developed by the multidisciplinary team. Regular assessments using the GCS can identify subtle changes in the patient's condition, which will be communicated to the team and may trigger further diagnostic evaluations, such as CT scans or MRI, to determine the cause of any deterioration. Furthermore, stroke care will increasingly focus on a holistic approach that addresses the psychological, emotional, and social needs of patients and their families. Nurses will be at the forefront of providing not only physical care but also psychological support. The future trend will see an emphasis on providing stroke survivors with resources and support networks to help them cope with the emotional challenges of recovery, reducing the risk of depression and anxiety following stroke.

Education and Training for Nurses

As stroke care evolves, so too will the education and training requirements for nursing professionals. Nurses will be expected to have advanced knowledge in areas such as stroke pathophysiology, cutting-edge monitoring techniques, telemedicine applications, and the use of AI in clinical decision-making. The integration of technology into nursing practice will necessitate ongoing training to ensure nurses remain proficient in utilizing advanced monitoring tools, such as continuous GCS monitoring devices, wearable sensors, and AI-based platforms. Additionally, nurses will need to be well-versed in the psychosocial aspects of stroke recovery, providing emotional support and educating patients and families about the challenges of post-stroke life. The inclusion of stroke-specific education programs in nursing curricula will be crucial in preparing future generations of nurses to provide high-quality care to stroke patients. The future of nursing care for acute brain stroke will be characterized by personalized interventions, advanced monitoring technologies, the integration of telemedicine, and the application of artificial intelligence. Nurses will continue to play an essential role in stroke management, using tools like the GCS to guide clinical decisions and facilitate communication within the interdisciplinary healthcare team. As stroke care continues to evolve, nurses will need to adapt to emerging technologies, enhance their skills, and provide comprehensive care that addresses the full spectrum of patient needs, from physical recovery to psychological support. Through continuous education, interdisciplinary collaboration, and innovative approaches to care, the nursing profession will be at the forefront of improving stroke patient outcomes and quality of life.

Conclusion:

Acute brain stroke remains a significant global health challenge, necessitating rapid and coordinated care to minimize mortality and disability. Effective management of acute stroke relies on timely intervention, particularly the use of thrombolytic therapy and mechanical thrombectomy in ischemic strokes and controlling bleeding in hemorrhagic strokes. Nursing care plays an integral role in stroke management, with nurses monitoring vital signs, detecting early complications, and providing critical support during acute phases of recovery. In the hospital setting, the implementation of stroke units staffed by multidisciplinary teams is essential. These units are designed to provide continuous, specialized care that optimizes patient recovery and reduces the risk of complications. Studies have consistently shown that patients admitted to stroke units experience better outcomes, including reduced mortality rates and fewer long-term disabilities. Nursing professionals in these units ensure that all aspects of stroke care, from initial evaluation to long-term rehabilitation, are managed efficiently, contributing to the overall success of the stroke unit model. Monitoring neurological signs and maintaining optimal blood pressure levels are key components of nursing care in the acute stroke phase. Blood pressure management, especially in patients undergoing reperfusion therapy, is critical to prevent further neurological damage. Effective monitoring protocols, including frequent assessments in the initial hours following reperfusion therapy, help to mitigate the risks associated with hemorrhagic transformation and ischemic injury. Nurses must be equipped with specialized training to manage the complexities of stroke care, including recognizing early signs of stroke, administering treatments, and managing the risks associated with stroke therapies. Furthermore, prehospital care teams play a crucial role in the early identification of stroke symptoms and facilitating rapid access to treatment. Integrating telemedicine, such as telestroke, enhances the coordination of care between emergency teams and tertiary stroke centers, improving patient outcomes. In conclusion, acute brain stroke requires a multifaceted approach, with nursing care at the heart of the recovery process. The implementation of evidence-based practices in stroke units, timely therapeutic interventions, and meticulous monitoring of neurological signs can significantly reduce the burden of stroke on patients and healthcare systems. Future research should continue to explore optimal care pathways, with a particular focus on improving nursing practices and early intervention strategies.

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رعاية التمريض ومر اقبة العلامات العصبية في السكتة الدماغية الحادة

الملخص:

الخلفية: السكتة الدماغية هي أحد الأسباب الرئيسية للوفيات والإعاقات على مستوى العالم. تحدث عندما ينقطع تدفق الدم إلى جزء من الدماغ، مما يؤدي إلى تلف الأنسجة وعجز عصبي. تصنف السكتة الدماغية الحادة إلى نوعين: السكتة الدماغية الإقفارية والنزفية، حيث تعد السكتة الدماغية الإقفارية هي الأكثر شيوعًا. يعد التعرف السريع والتدخل الفوري أمرًا بالغ الأهمية لتقليل تلف الدماغ وتحسين النتائج. تلعب رعاية السكتة الدماغية الحادة، وخاصة إدارة التمريض، دورًا حاسمًا في تحسين التعافي والوقاية من المضاعفات.

الهدف: تستكشف هذه الدراسة أهمية رعاية التمريض ومراقبة العلامات العصبية لدى المرضى المصابين بالسكتة الدماغية الحادة، مع التأكيد على التدخلات في الوقت المناسب لتعزيز التعافي وتقليل الإعاقة طويلة المدى.

الطرق: يراجع هذا المقال الأدبيات المتعلقة بإدارة السكتة الدماغية الحادة في كل من البيئة ما قبل المستشفى والمستشفى. يناقش دور التمريض في رعاية السكتة الدماغية، واستخدام وحدات السكتة الدماغية، ومراقبة ضغط الدم، وإدارة علاج إعادة التروية. تشمل الطرق الرئيسية التعرف المبكر على السكتة الدماغية، واستخدام العلاج المذيبات للتجلط وجراحة إزالة الجلطات الميكانيكية في السكتة الدماغية الإقفارية، والرعاية التمريضية المتخصصة في وحدات السكتة الدماغية.

النتائج: أظهرت وحدات السكتة الدماغية التي تقدم رعاية تمريضية متخصصة نتائج محسنّة، بما في ذلك انخفاض معدلات الوفيات والانتكاسات. يعزز التدبير المبكر باستخدام العلاج بالحقن الوريدي للذوبان في الجلطات وإزالة الجلطات الميكانيكية التعافي بشكل كبير لدى المرضى المصابين بالسكتة الدماغية الإقفارية. يعد التحكم في ضغط الدم، خاصة لدى المرضى الذين يخضعون لعلاج إعادة التروية، أمرًا بالغ الأهمية في الوقاية من المضاعفات مثل التحول النزفي وتفاقم الإصابات الإقفارية.

الخاتمة: يعد التدخل في الوقت المناسب والرعاية التمريضية الشاملة في إدارة السكتة الدماغية الحادة أمرًا ضروريًا لتحسين نتائج المرضى. تعتبر وحدات السكتة الدماغية المتخصصة والتعرف المبكر على أعراض السكتة الدماغية من العوامل الحاسمة لتعزيز جودة الرعاية. يلعب الممرضون دورًا حيويًا في مراقبة العلامات الحيوية، وإدارة ضغط الدم، وضمان فعالية علاجات إعادة التروية، مما يساهم في تحسين النتائج الوظيفية وتقليل عبء السكتة الدماغية.

الكلمات المفتاحية: السكتة الدماغية الحادة، السكتة الدماغية الإقفارية، السكتة الدماغية النزفية، رعاية التمريض، وحدات السكتة الدماغية، المراقبة العصبية، علاج إعادة التروية، إدارة ضغط الدم.