RESEARCH



Unaddressed palliative care needs of ischemic stroke patients treated with reperfusion therapies after age 80

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Abstract

Background The implementation of acute stroke care programs with dedicated multidisciplinary stroke teams has revolutionized access to care and improved survival among older adults. However, the integration of specialized palliative support within acute stroke services remains uncommon in many developing countries. This study highlights the emerging challenges faced by patients with ischemic stroke aged ≥ 80 years treated with reperfusion therapies, identifies early palliative care needs, and underscores the importance of comprehensive support in the acute setting.

Methods We selected consecutive patients with ischemic stroke aged ≥ 80 years who received reperfusion therapies (intravenous thrombolysis or mechanical thrombectomy) at the time of stroke unit admission. Clinical and demographic data were prospectively collected and analyzed.

Results A total of 52 patients aged \ge 80 years received reperfusion therapies. The in-hospital mortality rate was 5/52 (9.6%). Key challenges identified during hospitalization included dysphagia in 32 patients (61.5%), dyspnea in 7 patients (13.5%), delirium in 14 patients (26.9%), and mobility impairment and/or speech disturbance in 22 patients (42.3%).

Conclusion Despite the increasing use of reperfusion therapies in patients aged ≥ 80 years, symptoms requiring comprehensive support and early palliative interventions persist in the acute stroke setting. Our findings emphasize the need for early palliative assessments to address stroke-related symptoms such as dysphagia, delirium, and mobility or speech disturbances, ultimately enhancing patient comfort. Future research is necessary to better understand stroke-specific symptom burden in the aging population and to develop strategies for integrating palliative care into acute stroke management.

Keywords Geriatrics, Palliative needs, Ischemic stroke, Reperfusion therapies

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Introduction

Stroke is a leading cause of death and disability worldwide, significantly affecting the physical, social, emotional, and spiritual well-being of patients, their caregivers, and family members [1]. Patients with stroke aged \geq 80 years represent a vulnerable population, with distinct differences in their acute stroke presentation compared to younger individuals. These patients often have more comorbidities and disabilities, higher initial stroke severity at admission, poorer outcomes, limited access to therapeutic interventions, and reduced involvement in rehabilitation [2–5].

In Armenia, stroke is a significant public health concern, with a mortality rate of 75.5 per 100,000 population. The incidence of ischemic stroke is reported to be 185.3 per 100,000 population, though data on stroke severity remain scarce. According to the Ministry of Health, patients aged \geq 80 years comprise approximately 26%--32% of all stroke unit admissions. As of 2022, people aged \geq 80 years make up about 2.8% of the total population (approximately 3,000,000), with projections indicating that this percentage will rise to 5.6% by 2050 [6].

Recent advancements in the acute management of ischemic stroke in patients aged > 80 years have led to broader use of reperfusion therapies (RT), such as intravenous thrombolysis (IVT) and endovascular thrombectomy (EVT) [7, 8]. These treatments aim to restore blood flow to ischemic brain tissue, minimizing neuronal damage and improving survival and functional outcomes. While RT can improve function, recovery is not guaranteed. Even after successful reperfusion, many stroke survivors continue to face physical impairments, pain, fatigue, speech and swallowing difficulties, and cognitive and psychosocial challenges during acute and post-acute phases [2].

The introduction of acute stroke care programs with multidisciplinary stroke teams, regardless of age, has revolutionized access to care and improved survival in the geriatric population. However, in Armenia, as in many developing countries, the concept of specialized palliative care within acute stroke services has not yet been integrated. Stroke centers lack dedicated palliative care specialists or departments, and palliative services are primarily offered in private centers, without standardized protocols [9].

Given the shortage of geriatric specialists in Armenia and the growing population of those aged ≥ 80 years, it is essential to address the unique challenges they face in acute stroke care. Providing a comprehensive, holistic approach can help reduce suffering and optimize survival with disability.

This article highlights the emerging challenges faced by reperfusion-treated patients with ischemic stroke aged > 80 years, identifies early palliative care needs, and emphasizes the importance of comprehensive support in acute care settings.

Methods

We selected consecutive patients with ischemic stroke aged ≥ 80 years admitted to a tertiary stroke center in Armenia between January 1 and December 31, 2022. The establishment of specialized stroke centers in Armenia began in 2019 with the launch of the national stroke program. According to reports from the Ministry of Health, our center is one of the largest in the country, based on the number of patients with acute stroke treated with reperfusion therapies [10].

We prospectively recruited patients treated with RT (IVT, EVT, or IVT+EVT). Prior to admission, written informed consent for therapeutic or supportive decisions was obtained from the family members or official caregivers.

Data collected included sex, comorbidities, stroke severity as measured by the National Institutes of Health Stroke Scale (NIHSS) at admission, type of reperfusion procedure, in-hospital complications, mortality rates during hospitalization and at 3 months, and the presence of dysphagia, dyspnea, and delirium 24 h after RT. We also recorded mobility impairments, speech disturbances at discharge, median length of hospital stay (LOHS), and discharge destination. As no palliative care specialist was available, observations related to potential palliative care needs were made by stroke physicians.

Dysphagia was evaluated within 24 h after RT using the Gugging Swallowing Screen (GUSS) by a speech and language pathologist (SLP) [11]. Delirium was defined according to the World Health Organization's International Classification of Diseases (10th revision) [12]. Mobility impairments and speech disturbances were documented based on NIHSS assessments at discharge [13]. Symptomatic intracranial hemorrhage (SICH) was defined as the occurrence of intracranial hemorrhage associated with clinical deterioration and worsening neurological symptoms, typically within the first 24 to 72 h post-reperfusion therapy [14].

Data were collected by stroke team physicians and clinical residents using prospective registration in the hospital computer system. Data analysis was performed using IMB SPSS. Categorial data were presented as frequencies, and continuous data were presented as medians with interquartile range (IQR).

Ethics

The study was performed according to the Helsinki Declaration and was approved by the Institutional Review Board of Yerevan State Medical University (Ref No: 8-1/21) as part of a PhD thesis project titled "Strategies toward the improvement of post-stroke functional

Table 1	Baseline (Characteristics	of the	Study	Group
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Baseline characteristics (<i>n</i>) 52	n	(%)
Age (Median, IQR) 83 (81–87)		
Gender		
Female	36	(69,2%)
Male	16	(30,7%)
Presence of comorbidity	52	(100%)
Hypertension	44	(84,6%)
Diabetes type 2	5	(9,6%)
Coronary heart disease	3	(5,8%)
Heart failure	20	(38,5%)
Atrial fibrillation	28	(53,8%)
Valvular heart disease	27	(51,9%)
IVT	23	(44,2%)
IVT + EVT	12	(23,1%)
EVT	17	(32,7%)
LOHS (Median, IQR) 7(4–12)		
NIHSS admission (Median, IQR) 14(10–17)		
In hospital complications	15	(28,8%)
Pneumonia	4	(7,7%)
Symptomatic brain hemorrhage	4	(7,7%)
Cardiopulmonary insufficiency or myocardial infarction	7	(13,5%)
Dysphagia at 24 h after RT	32	(61,5%)
Delirium at 24 h after RT	14	(26,9%)
Dyspnea n	7	(13,5%)
Mobility impairment or speech disturbance at discharge	22	(42,3%)
In- hospital mortality rate	5	(9,6%)
Home	42	(80,8%)
Other institution	5	(9,6%)
Discharge destination		
Home	42	(80,8%)
Other institution	5	(9,6%)

Note. IVT=Intravenous Thrombolysis, EVT=Endovascular Thrombectomy, LOHS=Length of Hospital Stay, NIHSS=National Institutes of Health Stroke Scale. Discharge to other institutions was considered a direct transfer to a specialized palliative or rehabilitation center

outcome in patients \geq 80 years. Written informed consent was obtained from patients/participants or their family members to participate in this study.

Results

A total of 214 patients with acute ischemic stroke were admitted to the stroke unit from January 1 to December 31, 2022. Of these, 52 patients aged \ge 80 years received RT.

All participants had comorbidities, with hypertension in 44 (84.6%), atrial fibrillation in 28 (53.8%), and valvular heart disease in 27 (51.9%) being the most common. The in-hospital mortality rate was 5/52 (9.6%). SICH was detected in four cases (7.7%), while seven patients (13.5%) developed cardiopulmonary insufficiency requiring assisted ventilation.

Symptoms recorded as potential palliative care needs during hospitalization included dysphagia in 32 (61.5%), dyspnea in 7 (13.5%), and delirium in 14 (26.9%). As a consequence of stroke, mobility impairment and/or speech disturbance was documented at discharge in 22 patients (42.3%).

A total of 42 patients (80.8%) were discharged home, but family members of 29 (55.8%) declined medical recommendations for direct transfer to a specialized rehabilitation or palliative care facility. At 3 months, the mortality rate was 23.4% (11 of 47), and seven patients (14.9%) had moderate or severe mobility impairment based on modified Rankin Scale assessments. Table 1 summarizes clinical characteristics of the study group.

Discussion

Palliative care is an approach that focuses on identifying, preventing, and managing suffering to improve the quality of life for patients with life-threatening diseases [15]. However, palliative care needs in older adults with stroke remain underexplored and are often associated only with end-of-life care [16–18]. Many stroke survivors in this population are unable to express their needs or participate in decision-making due to high rates of impaired communication, cognitive dysfunction, and altered consciousness [19]. Furthermore, as noted in a study by Frontera et al., older adults with stroke are at greater risk of poor symptom control and unmet palliative needs [20].

To ensure a holistic, patient-centered approach in the acute setting, early identification of palliative care needs among stroke survivors and their family members is essential. We propose that in older adults with stroke, curative and palliative approaches should be integrated to support functionality, manage symptoms, and enhance comfort. Early recognition of these needs can improve both patient outcomes and family satisfaction with care.

According to the National Clinical Program for Palliative Care (NCPPC) and the National Coalition for Hospice and Palliative Care, any significant decline in a patient's functional status—regardless of disease progression or care setting—warrants a palliative assessment by an interdisciplinary team. The recommended framework identifies four key domains of palliative care assessment, one of which is physical well-being, encompassing symptoms such as delirium, disability, communication difficulties, and feeding problems [21].

Therefore, in this study, stroke-related symptoms that did not respond to medical treatment were considered potential palliative care needs. We aimed to highlight that even after successful stroke interventions, functional recovery is not guaranteed, necessitating palliative support in the early stages of care.

Symptom identification in this study was based on clinical judgment and existing literature rather than direct patient-reported concerns. While these symptoms did not always result in mortality, they indicated a substantial symptom burden requiring palliative interventions. This perspective aligns with the 2020 definition of palliative care by the International Association for Hospice and Palliative Care, which emphasizes the alleviation of serious health-related suffering throughout the trajectory of life-threatening conditions [22].

Our findings showed that dysphagia was the most frequently identified palliative care issue, affecting 61.5% of patients and necessitating nasogastric tube placement or dietary modifications. Decisions regarding non-oral supplementation or dietary changes were made in collaboration with family members. Mobility impairment and/or speech disturbances, documented in 22 patients (42.3%) at discharge, also required a palliative care approach, as rehabilitation participation was challenging for more than half of these patients.

Non-reported data indicated that swallowing disturbances were less prevalent among patients with stroke aged < 80 years, affecting 68 of 156 patients (43.5%). However, no statistical comparison was performed between age groups. Additionally, records of rehabilitative activity limitations were less frequent among younger patients.

A study by Burton and Payne investigating palliative care integration into acute stroke services found that, in addition to physical symptoms, post-stroke fatigue, anxiety, and concerns about dying were common experiences among stroke survivors [23]. This highlights the multidimensional nature of stroke-related palliative needs, which extend beyond physical symptoms to encompass emotional, social, and spiritual concerns. Future research should focus on structured screening programs and methodologies to assess these broader aspects of palliative care in patients with stroke [24].

Notably, none of the participants in our study were involved in decision-making regarding RT, diagnostic procedures, rehabilitation goals, or secondary stroke prevention strategies. All therapeutic and supportive decisions were made by family members or official caregivers, with written consent provided. Family discussions, led by stroke physicians, primarily focused on post-acute care training, secondary stroke prevention, and prognosis determination.

Our findings indicate that post-acute care in this population remains underdeveloped, as fewer than 10% of patients had direct access to rehabilitative or palliative facilities after hospital discharge. This may be attributed to financial constraints and cultural or religious beliefs regarding palliative care referrals in cases of uncertain prognosis.

Only 6 of 52 patients (11.5%) had an LOHS exceeding 10 days, reflecting adherence to guideline-based management. Additionally, literature suggests that early engagement in care planning, involving neurological, geriatric, and palliative specialists, facilitates decision-making and supports recovery [25]. We propose that involving family members in advance care planning from the first day of admission could reduce median LOHS, although this was not formally evaluated in our study.

Limitations of the study

This study has several limitations, including its singlecenter design, lack of a control group, and relatively small sample size. Furthermore, somatic symptoms such as pain, urinary and bowel incontinence, and psychological issues were not assessed. Patients with acute ischemic stroke who had contraindications to reperfusion therapies were not monitored. Additionally, we did not evaluate patient and caregiver experiences, priorities, or psychosocial factors. Lastly, the study data were descriptive and lacked statistical analyses to identify potential associations.

Conclusion

Despite the increasing use of reperfusion therapies in patients aged \geq 80 years, a range of symptoms requiring comprehensive support and early palliative interventions persists in the acute stroke setting. Our findings emphasize the need for palliative assessment during early stroke management to address symptoms such as dysphagia, delirium, and mobility or speech disturbances, ultimately enhancing patient comfort. Further research is necessary to better understand stroke-specific symptom burdens in aging populations and to develop strategies for integrating palliative care into acute stroke management.

Supplementary Information

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Supplementary Material 1

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Author contributions

GS drafted the initial manuscript and was responsible for its design, structure, and final version. MO, AA, and KK conducted data collection, data entry, and analysis. HM and GH provided critical revisions and guidance during manuscript drafting. AK provided critical feedback and contributed to the final review of the manuscript. All authors reviewed and approved the final manuscript.

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Data availability

The raw data supporting the findings of this study will be made available by the authors upon reasonable request and without undue restriction.

Declarations

Ethical approval

This study was performed according to the Helsinki Declaration and received approval from the ethical committee of Yerevan State Medical University as part of the project: "Strategies toward the improvement of post-stroke

functional outcome in patients \geq 80 years." Written informed consent was obtained from all patients or their family members.

Competing interests

The authors declare no competing interests.

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