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ORIGINAL ARTICLE

Geriatric Stroke Management: Lessons Learned from Case Series

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Abstract

Stroke is a common medical emergency, requiring prompt recognition and intervention. The study examines stroke presentations in patients aged 60 years and above at Hospital Sultanah Nur Zahirah (HSNZ) Emergency Department, both ischemic and haemorrhagic subtypes. Our aims is to elucidate clinical manifestations, facilitate timely diagnosis, and optimize management strategies. The series comprises four cases illustrating diverse stroke presentations and therapeutic considerations. Case Report 1 highlights the importance of identifying vascular risk factors and urgent neuroimaging. Case Report 2 underscores the need for secondary prevention measures in patients with a history of transient ischemic attack (TIA). Case Report 3 emphasizes rapid assessment, blood pressure control, and neurosurgical intervention in acute intracerebral haemorrhage. Case Report 4 illustrates the complexities of stroke sequelae and comprehensive care.Through neurological examination, neuroimaging studies and initial baseline blood investigation, the cases highlight the significance of a systematic approach to stroke assessment in elderly patients. Interdisciplinary collaboration among healthcare professionals is crucial for optimal stroke care management. The case series provides insights into nuanced stroke presentations and management dilemmas in elderly patients, aiming to inform evidence-based practices and improve outcomes. Continued research and interdisciplinary collaboration are essential for addressing evolving challenges in stroke management and enhancing care for elderly stroke survivors.

Keywords: Stroke, Clinical Presentation, Diagnosis, Emergency Department, Elderly Patients

Introduction

Stroke represents an emergence health issue globally, with a substantial impact on morbidity and mortality, particularly among the elderly population. Stroke incidence and prevalence increase significantly with age, with the elderly population bearing the highest burden of this condition. According to population-based studies, individuals aged 65 years and older account for most

stroke cases and the risk continues to rise with advancing age (Ralston *et al.,* 2018). The aging demographic trend mandates the importance of understanding stroke in the elderly and implementing preventive measures to mitigate its serious complications or impact.

Numerous risk factors contribute to the development of stroke in the elderly, including hypertension, diabetes mellitus, hyperlipidaemia, atrial fibrillation, smoking, obesity, sedentary lifestyle, and previous history of stroke or transient ischemic attack (TIA) (Samuthpongtorn, C. *et al.,* 2021) The interplay between traditional vascular risk factors and age-related physiological changes predisposes elderly individuals to an increased risk of stroke. Moreover, the presence of multiple comorbidities and polypharmacy further complicates stroke risk assessment and management in this vulnerable group of patient.

Stroke presentations in the elderly may vary widely, ranging from classic manifestations such as hemiparesis, aphasia, and visual field deficits to more subtle symptoms such as confusion, altered mental status, and falls (Muangpaisan *et al.,* 2008). The heterogeneity of clinical presentations poses diagnostic challenges, as elderly patients may have pre-existing cognitive impairments or functional limitations that obscure stroke symptoms. Early recognition of stroke warning signs and prompt evaluation are critical to facilitate timely intervention and prevent adverse outcomes in elderly stroke patients (Huggins *et al.,* 2020).

A complete evaluation of stroke in the elderly involves a multidisciplinary approach, incorporating clinical assessment, neuroimaging studies, and laboratory investigations. Neuroimaging modalities, including computed tomography (CT) and magnetic resonance imaging (MRI), play a pivotal role in confirming the diagnosis, determining stroke subtype, and assessing the extent of brain injury. Additionally, ancillary tests such as electrocardiography (ECG), carotid ultrasound, and trans-oesophageal echocardiography (TEE) may identify underlying cardiac sources of embolism and extra-cranial vascular pathology (Gongora Rivera *et al.,* 2007).

The specific emergency management of stroke in the elderly aim on rapid reperfusion and neuroprotective strategies to salvage ischemic brain tissue and minimize disability (Iglesias Rey R. *et al.,* 2021). Intravenous thrombolysis with tissue plasminogen activator (tPA) and endovascular thrombectomy are established treatments for acute ischemic stroke, with demonstrated efficacy in elderly patients. However, patient selection and treatment eligibility criteria carefully considered, taking into account the risk of haemorrhagic transformation and procedural complications (Iglesias Rey et al., 2021). In haemorrhagic stroke, aggressive blood pressure control, reversal of anti-coagulation and surgical interventions warranted to mitigate hematoma expansion and alleviate mass effect. The management of acute complications, including seizures, infections, and electrolyte imbalances, requires vigilant monitoring and targeted interventions to optimize outcomes in elderly stroke patients (Kaye, 2006).

A comprehensive rehabilitation programs are integral components of stroke care in the elderly, aiming to maximize functional independence, promote quality of life, and facilitate community reintegration. Multidisciplinary rehabilitation teams, comprising physical therapists, occupational therapists, speech-language pathologists, and neuropsychologists, deliver individualized interventions tailored to the unique needs and goals of elderly stroke survivors (Belagaje, 2017). The continuum of care extends beyond the acute hospitalization phase to encompass transitional care models, community-based support services, and stroke survivorship programs, addressing the evolving needs of elderly stroke patients throughout their recovery journey (Seijas *et al.,* 2024).

The prognostic factors influencing outcomes in elderly stroke patients include stroke severity, age, pre-existing comorbidities, functional status, cognitive impairment, and social support networks (Slot *et. al.,* 2008). However, the functional recovery and mortality rates vary depending on the type and severity of stroke, as well as the timeliness and effectiveness of interventions. Long-term follow-up studies provide insights into post-stroke trajectories and identify predictors of functional decline, recurrent vascular events, and nursing home placement in elderly stroke survivors (McGlinchey *et. al.,* 2018).

In conclusion, a total understanding of stroke in the elderly is essential for healthcare providers to deliver high quality, patient-centred care and support optimal outcomes for this vulnerable population.

Materials and Methods

A retrospective case series analyses stroke presentations among patients aged 60 years and above at HSNZ Emergency Department. Clinical records, imaging studies, and management interventions reviewed to delineate diverse stroke manifestations and therapeutic approaches.

Result and Discussion

Case Report 1

Mr. A, a 72-year-old Malay male with a history of hypertension and diabetes mellitus, presented with acute-onset right-sided weakness and speech difficulty for one-day duration. He reported no antecedent trauma or prodromal symptoms.

On examination, Mr. A exhibited right-sided hemiparesis with a power of 3/5 in the upper and lower limbs. Speech was dysarthria, and facial droop was evident. Vital signs were within normal limits, with except a blood pressure of 150/90 mmHg. An urgent non-contrast CT scan revealed a hypodense lesion involving the left middle cerebral artery territory, consistent with acute infarction. Laboratory investigations demonstrated elevated blood glucose levels.

Mr. A received aspirin and initiated on a statin and antihypertensive therapy. Intravenous thrombolysis contraindicated due to delayed presentation. Rehabilitation services engaged for early mobilization and functional recovery. Despite intensive rehabilitation, Mr. A experienced residual motor deficits but demonstrated gradual improvement in functional abilities.

Case Report 2

Mrs. B, a 68-year-old female with a history of atrial fibrillation and anticoagulant use, presented with sudden-onset loss of consciousness at home. She brought to the Emergency Department by family members.

On arrival, Mrs. B was comatose with a Glasgow Coma Scale score of 6/15. Pupils bilaterally dilated, and de-cerebrate posturing noted. Blood pressure was elevated at 180/100 mmHg. CT imaging revealed a large left basal ganglia haemorrhage with midline shift and ventricular compression. Laboratory investigations were unremarkable except for deranged coagulation parameters due to anticoagulant therapy.

Mrs. B underwent emergent neurosurgical intervention for hematoma evacuation and decompression. Anticoagulation reversed with prothrombin complex concentrate, and blood pressure meticulously controlled to prevent re-bleeding. Despite aggressive management, Mrs. B succumbed to intracranial complications secondary to massive haemorrhage.

Case Report 3

Mr. C, a 71-year-old man with a history of coronary artery disease and hyperlipidaemia, presented with recurrent episodes of transient aphasia and left-sided weakness over the past week.

Upon examination, Mr. C was neurologically intact with no residual deficits. Blood pressure and other vital signs were within normal limits. CT angiography demonstrated significant carotid

artery stenosis, consistent with a high-risk source of embolism. Echocardiography revealed left ventricular hypertrophy with preserved ejection fraction.

Mr. C was initiated on dual antiplatelet therapy and statin therapy for secondary stroke prevention. He undergone carotid endarterectomy to mitigate the risk of recurrent ischemic events. Following surgical intervention, Mr. C remained asymptomatic without further TIA episodes during follow-up.

Without any doubt, stroke management in elderly populations remains a significant challenge to healthcare providers globally. The cases of Mr. A, Mrs. B, and Mr. C offer invaluable insights into stroke management paradigms, reflecting the multifaceted nature of cerebrovascular disease and the imperative for tailored interventions to optimize patient outcomes amidst varying stroke pathologies and clinical complexities. Case Report 1 highlights the importance of identifying vascular risk factors and urgent neuroimaging. Case Report 2 underscores the need for secondary prevention measures in patients with a history of transient ischemic attack (TIA). Case Report 3 emphasizes rapid assessment, blood pressure control, and neurosurgical intervention in acute intracerebral haemorrhage. Case Report 4 illustrates the complexities of stroke sequelae and comprehensive care.

Lesson learnt from these case series aims to elucidate key considerations in optimizing stroke management in geriatric patients, drawing insights from experience of clinical practice and evidence-based research. By addressing diagnostic complexities, therapeutic dilemmas, and rehabilitation strategies, healthcare providers can enhance outcomes and quality of life for elderly stroke survivors (Lui and Nguyen, 2018).

Mr. A's case exemplifies a common clinical scenario encountered in the management of acute ischemic stroke, particularly among elderly patients with established vascular risk factors such as hypertension and diabetes mellitus. His clinical presentation, characterized by acute-onset right-sided weakness and speech difficulty, highlight the importance of prompt recognition and evaluation of stroke symptoms. The timely initiation of diagnostic modalities, including neurological examination and urgent non-contrast CT imaging, facilitated accurate diagnosis and guided subsequent management decisions (Puig *et al*., 2020).

The rapid identification of a hypodense lesion involving the left middle cerebral artery territory on imaging corroborated the clinical suspicion of acute infarction, guiding the implementation of appropriate therapeutic interventions. Our emergence management strategies adhered to established stroke care guidelines, incorporating antiplatelet therapy, statin administration, and antihypertensive initiation, with a focus on secondary prevention and risk factor management as well as early referral to rehabilitation services. Engagement of rehabilitation services for early mobilization and functional recovery through multidisciplinary approach is essential in optimizing post-stroke outcomes (Lui and Nguyen, 2018).

The main challenges inherent in Mr. A's case include the limited window for thrombolytic therapy and the persistence of residual motor deficits despite intensive rehabilitation efforts. From previous study, it indicate that patients with minor non-disabling neurological deficits who treated with alteplase did not benefit when compared to aspirin (Khatri *et al.,* 2018). In addition, the association of elevated blood glucose levels mandate a comprehensive assessment and intervention in patients with diabetes mellitus because hyperglycaemia is predictors for infection and poor outcome in stroke patients (Weir *et al.,* 1997). In contrast, Mrs. B's case portrays a grave clinical scenario of spontaneous intracerebral haemorrhage (ICH) in an elderly female with atrial fibrillation managed on anticoagulant therapy. Her sudden loss of consciousness, comatose state, and neurological deterioration reflect the severe intracranial haemorrhage and its dire consequences.

Diagnostic imaging via CT scan delineated a substantial left basal ganglia haemorrhage with midline shift and ventricular compression, underscoring the urgency of intervention. The critical clinical status of Mrs. B's such as dilated pupils and de-cerebrate posturing signalled significant neurological compromise necessitating immediate medical intervention. Immediate

therapeutic interventions, including emergent neurosurgical evacuation and tight control of blood pressure coupled with reversal of anticoagulation, aimed to alleviate intracranial pressure and mitigate re-bleeding risks was carried out. This case emphasise the formidable challenges associated with managing spontaneous ICH, particularly in patients receiving anticoagulant therapy. It accentuate the importance of timely diagnosis, multidisciplinary collaboration, and aggressive therapeutic interventions in optimizing outcomes (Herpich and Rincon, 2020).

In contrast to the acute stroke presentations of Mr. A and Mrs. B, Mr. C's case highlights the intricate management of transient ischemic attacks (TIAs) and significant carotid artery stenosis in an elderly individual with a history of coronary artery disease and hyperlipidaemia. Mr. C's clinical manifestation of TIAs coupled with significant carotid artery stenosis and left ventricular hypertrophy underscores the multifactorial nature of stroke risk assessment and prevention strategies in the elderly population. Electrocardiogram is particularly important in the setting of stroke, as patients with ischemic stroke frequently harbour coronary artery disease but may not be able to report chest pain. Current guidelines recommend cardiac monitoring for at least the first 24 hours after the onset of ischemic stroke to look for atrial fibrillation (AF) or atrial flutter (Powers *et al.,* 2019).

Mr C's risk of stroke is high as derived from the Framingham Study (Wolf *et al.,* 1991). The clinical treatment rendered, comprising dual antiplatelet therapy, statin therapy, and carotid endarterectomy, reflects a tailored approach to secondary stroke prevention, integrating pharmacological and surgical modalities. Guidelines from the American Heart Association and American Stroke Association advocate a multidisciplinary, team-based approach for effective risk management, with treatment tailored to the individual patient (Kleindorfer *et al.,* 2021).

Such interventions aim to mitigate thrombotic and embolic risks while addressing underlying atherosclerotic burden. Furthermore, the successful outcome observed in Mr. C post-surgery emphasizes the efficacy of timely and targeted interventions in mitigating recurrent cerebrovascular events. Ultimately, the case of Mr. C serves as a catalyst for ongoing scholarly inquiry, driving advancements in stroke management paradigms and improving clinical practice guidelines.

Limitation

This case series is retrospective and subject to inherent biases and limitations associated with chart reviews. Further prospective studies warranted to elucidate optimal management strategies and long-term outcomes in elderly stroke populations.

Conclusion

Enhancing stroke management in geriatric patients requires a comprehensive and patient-centred approach, addressing diagnostic uncertainties, therapeutic complexities, and rehabilitation needs. Minimizing the initial effect of stroke changes the outcome and leads to an increased likelihood of functional independence. By leveraging interdisciplinary expertise, innovative technologies, and translational research, healthcare providers can optimize outcomes and promote resilience in elderly stroke survivors, ultimately reducing the burden of stroke-related morbidity and mortality worldwide.

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