



EMPHNET's Research Digest

Stroke Services in the Middle East and Adjacent Regions: A Survey of 34 Hospital-based Stroke Services

Introduction

Stroke is a significant health concern worldwide, leading to a high rate of death and disability. Despite becoming the fifth leading cause of death in high-income countries (HICs) due to successful prevention and treatment strategies over the past five decades, stroke retains its place as the second most common cause of death in low to upper-middle-income countries (LMICs).

This discrepancy is clearly seen in the Middle East and North Africa (MENA), home to an estimated 411 million people, where the incidence of stroke seems to be on the rise. The incidence of stroke in the MENA region varies from 29.8 per 100,000 people in Saudi Arabia to 57 per 100,000 in Bahrain. The 28-day case mortality rate also ranges considerably from 10% in Kuwait to 31.5% in Iran. Even though these numbers are similar to those in HIC nations, the impact is more pronounced in MENA due to its younger population.

The MENA-Stroke and Interventional Neuro-Organization (MENA-SINO), a group of stroke experts from 19 MENA and adjacent countries (Bahrain, Egypt, Iran, Indonesia, Iraq, Jordan, Kuwait, Lebanon, Malaysia, Oman, Pakistan, Saudi Arabia, Sudan, Turkey, Thailand, United Arab Emirates, Yemen, and Qatar), aims to improve education, research, and healthcare for stroke in the region. While progress has been made in enhancing stroke care in MENA, there is an ongoing need for an integrated regional stroke system, both at local hospitals and across the region. A [recent study](#) was conducted to evaluate the state of readiness of stroke programs in the MENA and surrounding regions (MENA+) to treat acute stroke.

Methodology for Evaluating Stroke Programs in the MENA+ Region

The researchers implemented an online survey to evaluate hospital demographics, interest in stroke program certification, design of

stroke program infrastructure, availability of complementary services, diagnostic capabilities, patient monitoring capabilities, standard operating procedures, and the existence of effective legislation. They further evaluated the implementation of integrated inter-hospital protocols and various treatment modalities for acute stroke. The survey was distributed to stroke and neuro interventionists' center leaders (including stroke program directors, stroke neurologists, neuro interventionalists, neurosurgeons, and neuroradiologists). Each participating center was limited to a single response. This survey process spanned from April 2021 to January 2022.

Findings

Survey Participants and Hospital Infrastructure

The survey incorporated responses from 34 hospitals located across 19 countries. Out of the hospitals surveyed, 55.9% were affiliated

with universities, underscoring the importance of academic and research contribution to the management of stroke.

Hospitals had a median catchment area population of approximately two million people, and had varying capacities to manage stroke cases, with annual admissions ranging from as few as 36 cases at Family Care Hospital in Riyadh to as many as 10,000 cases at Al-Hussein University Hospital in Cairo. On average, hospitals saw about 600 stroke admissions per year, half of which were admitted to dedicated stroke units. The stroke units in these hospitals were predominantly situated in neurology departments (52.9%) or internal medicine departments (26.5%), allowing for specialist care for stroke patients. Hospitals reported a median length of stay of eight days for stroke patients, while the stay at stroke units was typically five days. This stay duration is a critical aspect of stroke management, affecting patient recovery and healthcare resources.

Service Availability and Specialties

The provision of clinical and biochemical emergency laboratory tests, which are crucial for the initial assessment and continuous monitoring of stroke patients, is uniform across all hospitals. All participating hospitals are equipped with CT scanners, functioning around the clock. A majority of these hospitals (76.5%) also offer 24/7 cerebral CT angiogram facilities. However, the availability of brain MRI services is limited to only half of the hospitals.

Multidisciplinary Services

The presence of multidisciplinary services is a strong feature, with nearly all hospitals (97%) having neurosurgical services. A high percentage of hospitals also have access to cardiology experts (88.2%), internal medicine services (94.1%), neuroradiological expertise

(88.2%), and vascular surgery expertise (79%).

Clinical Guidelines and Stroke Assessment Tools

Stroke informational manuals are only available in 79.4% of hospitals, and nursing manuals are accessible in 82.4%. Only half have prehospital acute stroke care guidelines. The National Institutes of Health Stroke Scale is predominantly used to evaluate acute stroke symptoms 82.4%, while the rest use the Glasgow Coma Scale.

Clinical Trials and Rehabilitation Services

Clinical stroke trials are conducted in 44.1% of the hospitals, and post-stroke rehabilitation services are present in 88.2% of hospitals. still, telemedical/tele radiological links with other stroke care facilities are available in only 17.6% of hospitals.

Treatment Options

In terms of treatment modalities, intravenous thrombolysis (IVT) is offered in 20.6% of hospitals. Mechanical thrombectomy, with or without IVT, is available in a higher number of hospitals (70.6%). Notably, only a small fraction of hospitals (8.8%) does not offer these treatments.

A median of 10 decompressive craniotomies are performed annually per hospital for malignant brain infarctions (IQR: 4 - 20). Carotid interventions, such as surgeries or stenting, are carried out at a median rate of 20 times per year across all hospitals (IQR: 5 - 45).

Around 84% of the hospitals are equipped to treat subarachnoid aneurysmal hemorrhages, highlighting their ability to address various types of strokes. Most hospitals also have facilities for reversing anticoagulation-related intracerebral hemorrhage, with the median time to start treatment being 35 minutes.

Key Treatment Metrics

The median percentage of acute ischemic stroke patients whose IVT treatment is started within, or less than 60 minutes of hospital arrival (door-to-needle) is 51%. Concurrently, the median percentage of eligible patients who receive IVT within the appropriate time window (4.5 Hours after symptom onset) is only 56%.

The median proportion of patients treated with IVT who had symptomatic hemorrhagic transformation (HT) within 36 hours of treatment was 6% (IQR: 4%-10%). Among patients with acute ischemic stroke who received endovascular interventions, the median percentage who developed HT was slightly lower at 5.5% (IQR: 2% - 10%).

Conclusion

This comprehensive study on acute stroke management resources in the MENA+ has unearthed a compelling need for increased regional and global collaboration. Despite the observed disparities in stroke treatment, several positives emerged.

The study revealed cyclical access to CT scanning. Neurosurgical services in 97% of hospitals. Post-stroke rehabilitation services were prevalent in about 90% of the hospitals, but intravenous thrombolysis (IVT) was only offered in 20.6% of them. Though only half of the hospitals have established prehospital acute stroke care guidelines, the foundation for acute stroke management is present. Regional and international cooperation is required to advance stroke care and begin accreditation of the region's current stroke programs. Prospective registries and databases with the engagement of stakeholders to ensure engagements of more centers in future studies might help to better understand and classify the current situation of acute stroke services available in the region.

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