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Study of Procedures Provided for Stroke Patients in Intensive Care Units of Public Hospitals in Western Libya

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دراسة الإجراءات المقدمة لمرضى السكتة الدماغية في وحدات العناية المركزة بالمستشفيات العامة في غرب ليبيا

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Abstract:
Stroke remains a prominent cause of mortality and morbidity globally, with ischemic strokes comprising 87% of cases. Conversely, hemorrhagic strokes, such as intracerebral and subarachnoid hemorrhages, account for a lesser fraction. Prognostically, ischemic stroke typically offers a more favorable outcome compared to hemorrhagic stroke, especially during the acute phase. Effective neurological rehabilitation can substantially enhance recovery outcomes, yet the recovery mechanisms may vary between the two stroke types. This study evaluated and compared the management protocols for ischemic and hemorrhagic stroke patients in intensive care units (ICUs) in western Libya. Conducted as a single-center, retrospective observational research, it included 600 adult patients diagnosed from July 18, 2023, to February 10, 2024. Data were systematically gathered from clinical records through a tailored questionnaire, addressing socio-demographic traits, stroke type, and critical care interventions. Among the 600 patients, 280 were female and 320 males, with average ages of 65.54 years and 62.75 years, respectively. Hemorrhagic strokes occurred in 32.82% of patients, while ischemic strokes were noted in 28.47%. Interventions included tracheostomy (36.7%), nasogastric tube placement (66.7%), and percutaneous endoscopic gastrostomy (23.3%). Notable complications encompassed cardiorespiratory failure (41.7%), acute thrombophlebitis (23.3%), and severe hypertension (71.7%). The study underscores the influence of gender on stroke outcomes and emphasizes the necessity for further investigations to identify stroke-specific risk factors and to optimize critical care strategies. It highlights the importance of individualized treatment approaches tailored to stroke classification and patient demographics.

Keywords: Stroke Hemorrhagic, Ischemic, Intensive care units.

الملخص
تبقى السكتة الدماغية سببًا بارزًا للوفيات على مستوى العالم، حيث تشكل 87% من الحالات من السكتات الدماغية الإقفارية. بالمقابل، تمثل السكتات الدماغية النزيفية، مثل النزيف داخل الدماغ والنزيف تحت العنكبوتية، نسبة أقل. من الناحية التنبؤية، تقدم السكتة الدماغية الإقفارية عمومًا نتائج أكثر إيجابية مقارنة بالسكتات النزيفية، خاصةً خلال المرحلة الحادة. يمكن أن تعزز إعادة التأهيل العصبي الفعالة بشكل كبير من نتائج التعافي، لكن آليات التعافي قد تختلف بين نوعي السكتة الدماغية.

تعتبر هذه الدراسة تقييمًا ومقارنةً للبروتوكولات العلاجية لمرضى السكتة الدماغية الإقفارية والنزيفية في وحدات العناية المركزة *(ICUs)* في غرب ليبيا. تم إجراء الدراسة على 600 مريض بالغ تم تشخيصهم من 18 يوليو 2023 إلى 10 فبراير 2024. تم جمع البيانات بطريقة منهجية من السجلات السريرية من خلال استبيان مخصص، تناول الخصائص الاجتماعية والديمغرافية، نوع السكتة، والتدخلات الرعاية الحرجة. من بين 600 مريض، كان 280 إناثًا و320 ذكورًا، بمتوسط أعمار بلغ 65.54 عامًا للإناث و62.75 عامًا للذكور. سجلت السكتات الدماغية النزيفية في 32.82% من المرضى، بينما سجلت السكتات الدماغية الإقفارية في 28.47%. شملت التدخلات إجراء ثقب الرغامي (36.7%)، وتركيب أنبوب أنفي معدي (66.7%)، وتغذية عبر الجلد بالمنظار (23.3%). تضمنت المضاعفات الملحوظة فشلًا قلبيًا تنفسيًا (41.7%)، والتهاب الوريد الخثاري الحاد (23.3%)، وارتفاع ضغط الدم الشديد (71.7%). تؤكد الدراسة على تأثير الجنس على نتائج السكتة الدماغية، وتبرز الحاجة إلى مزيد من التحقيقات لتحديد عوامل الخطر المرتبطة بالسكتة الدماغية وتهيئة استراتيجيات الرعاية االفائقة. كما تسلط الضوء على أهمية تقديم خطط علاجية فردية تتناسب مع تصنيف السكتة الدماغية وخصائص المرضى الديمغرافية.

الكلمات المفتاحية: السكتة الدماغية النزفية، الإقفارية، وحدات العناية المركزة.

Introduction

Stroke is one of the world's leading causes of death and disability. Ischemic stroke is nowadays considered a time-dependent disease due to the availability of acute treatments and represents 87% of all strokes. Hemorrhagic strokes include intra-cerebral hemorrhage, representing 10% of all strokes, and aneurysmal subarachnoid hemorrhage, which represents 3% of all strokes (Virani et al., 2020). In 2017, a total of 2.7 million individuals died of ischemic stroke, 3 million of intra-cerebral hemorrhage, and 0.4 million of aneurysmal subarachnoid hemorrhage (La Pira et al., 2018). Overall, the general prognosis of ischemic stroke is considered better than that of hemorrhagic stroke, in which death occurs especially in the acute and sub-acute phases (Winstein et al., 2016).

Neurologic rehabilitation has the potential to affect functional outcomes in stroke patients by means of many different mechanisms (Kitago & Ratan, 2017).Post-stroke recovery has been widely studied mainly in ischemic stroke, but as pathophysiology between ischemic and hemorrhagic forms is different, it could be hypothesized that also mechanisms of recovery and outcomes are dissimilar (Fogelholm, R et al., 2005) Comparisons between recovery outcomes in patients with ischemic and hemorrhagic stroke have yielded mixed results: Some studies, mainly community- or acute hospital-based, have found comparable activity limitation and recovery (Wei, J.W et al., 2010), whereas others have found greater recovery after hemorrhagic stroke . Evidence of a similar or worse functional outcome in hemorrhagic stroke patients compared to ischemic ones mainly comes from community- or acute hospital-based studies, while better outcomes in hemorrhagic stroke patients were most common in studies conducted in the rehabilitation setting. Despite the few studies specifically focused on hemorrhagic stroke, available data show that the majority of motor recovery after hemorrhagic stroke seems to occur early, within the first 3–6 months (Lee, K. B et al., 2015). More data are needed to better elucidate the recovery after rehabilitation in hemorrhagic strokes. The current study conducts a retrospective review of clinical records for stroke patients who received intensive neurological rehabilitation during their hospital stay. It aims to evaluate and compare the procedures administered to ischemic and hemorrhagic stroke patients during their hospitalization in intensive care unit hospitalization in western Libya.

Materials and Methods

Study sample and duration:

The current study was a single-center, retrospective observational analysis utilizing data obtained through the review of clinical records of consecutive stroke patients admitted for an intensive neurological rehabilitation program. The study included adult patients (aged >18 years), with a total sample of 600 individuals diagnosed with either ischemic or hemorrhagic stroke. The data collection period spanned from July 18, 2023, to February 10, 2024.

Data collection:

Data were collected using a questionnaire prepared specifically for this study, and this questionnaire was filled out form the archives of hospitals in western Libya.

The study was conducted in accordance with *the Helsinki Declaration* and was approved by the local ethics committee.

The following data were collected from clinical records:

(1) Socio-demographic characteristics (age, sex), vascular risk factors, and history of previous stroke;
(2) classification of stroke type (ischemic vs. hemorrhagic.
(3) Critical management procedure in intensive care units in private and public hospitals in western Libya.

Statistical Analyses
Descriptive analyses using (R. tutor-0.98) (means and standard deviations or frequencies and percentages) were used to illustrate the total sample characteristics.

Results
This study encompassed 600 patients diagnosed with either ischemic or hemorrhagic stroke. Table 1 outlines the sociodemographic characteristics of the participants, including age, gender, weight, and height. According to the data presented in Table 1, the cohort comprised 280 women with a mean age of 65.54 years and 320 men with a mean age of 62.75 years. The statistical significance of the P-test for age was 0.520. Regarding weight, the mean weight of female participants was 73.07 kg, whereas the mean weight of male participants was 84.12 kg, with the P-test yielding a statistically significant value of 0.011. Furthermore, the overall P-test significance for gender distribution was 0.930. These findings highlight distinct gender-based variations in the demographic and physiological profiles of stroke patients.

Table 1: The sociodemographic data of the study sample.

TEST	F	M	P
N	280	320	-
s_n (mean (SD)	30.29 (17.85)	30.69 (17.41)	0.930
height_ cm (mean (SD)	163.18 (7.46)	171.19 (10.50)	0.001
weight_ kg (mean (SD)	73.07 (21.31)	84.12 (10.24)	0.001
Age (mean (SD)	65.54 (20.29)	62.75 (12.60)	0.520

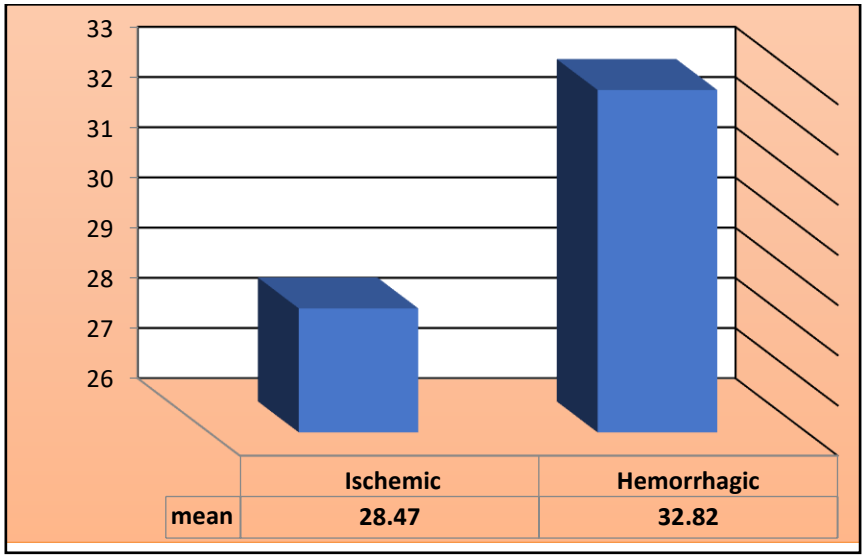

Figure 1: The types of strokes.

Figure 1 illustrates the distribution of stroke types within the study sample, revealing a mean incidence of hemorrhagic strokes at 32.82% and ischemic strokes at 28.47%. Table 2 provides additional insights into the medical interventions among the participants. Notably, 36.7% of patients underwent tracheal suctioning to remove thick mucus and secretions from the trachea and lower airway, which could not be expelled through coughing. Furthermore, 66.7% of patients utilized nasogastric tubes for the delivery of substances to the stomach, while 23.3% underwent percutaneous endoscopic gastrostomy (PEG) as a means of feeding tube placement. Additionally, it is observed that 50% of the patients were managed with ventilatory support. These findings highlight the diverse medical needs and interventions required for the stroke population in the study.
Stroke patients often experience various complications. In this study, it was observed that 41.7% of the participants suffered from cardiorespiratory failure, while 23.3% were affected by acute thrombophlebitis. Additionally, 71.7% of the patients exhibited extreme hypertension, as detailed in Table 3.

Table 2: Intensive care procedures for stroke patients

Factor	N. Sample	Stats / Values	Freqs (% of Valid)
Tracheostomy	600	No	380 (61.7%)
		Yes	220 (36.7%)
NG. Tube	600	No	200 (33.3%)
		Yes	400 (66.7%)
Gastrostomy. PEG	600	No	460 (76.7%)
		Yes	140 (23.3%)
Ventilator	600	No	300 (50.0%)
		Yes	300 (50.0%)
Breathe Without Any Support	600	No	260 (43.3%)
		Yes	34 0(56.7%)

Table 3: Complication associated with stroke.

No Variable	N. Sample	Stats / Values	Freqs (% of Valid)
Cardio Respiration System Failure	600	No	350 (58.3%)
		Yes	250 (41.7%)
Acute Thrombophlebitis	600	No	460 (76.7%)
		Yes	140 (23.3%)
Extreme hypertension	600	No	170 (28.3%)
		Yes	430 (71.7%)

Figure 2 illustrates the types of secondary injuries observed following a stroke. The results indicate that cerebral edema was the most prevalent, affecting 42.40% of patients, followed by progressive stroke at 32.60%, and hemorrhagic transformation at 25.00%.

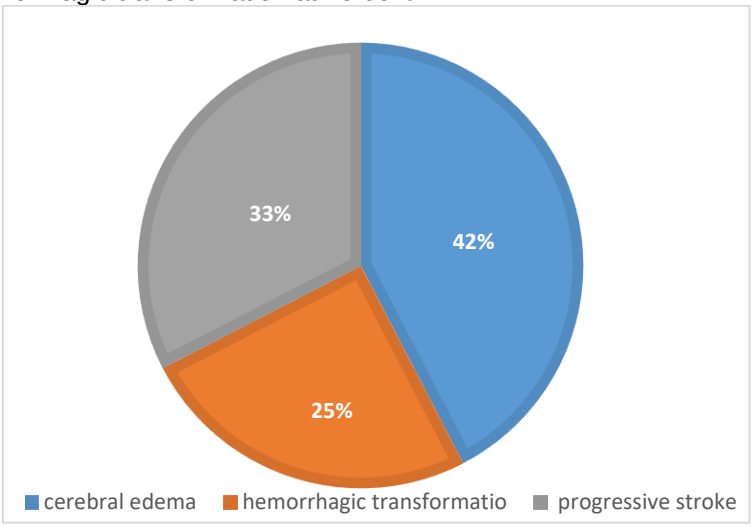

Figure 2: The types of secondary injury after stroke.

Figure 3 depicts the ICU interventions for managing secondary injuries following a stroke. The findings indicate that augmentation was the most commonly employed intervention, accounting for 56.70%, followed by the reversal of coagulopathy at 33.30%, and osmotic therapy at 10.00%.

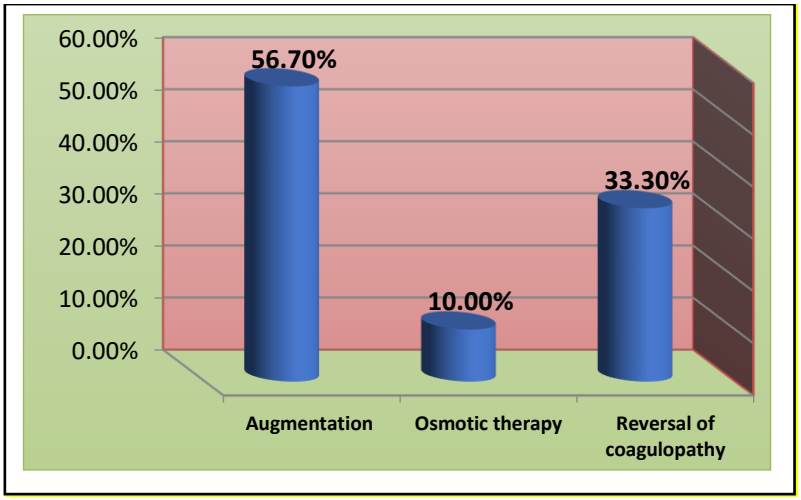

Figure 3: ICU interventions of secondary injury after stroke.

Discussion

Stroke is a significant global health issue, being one of the leading causes of death and long-term disability. The two primary types of strokes, ischemic and hemorrhagic, present distinct challenges in terms of treatment and recovery. Ischemic strokes account for approximately 87% of all strokes, while hemorrhagic strokes, including intra-cerebral hemorrhage and subarachnoid hemorrhage, represent 10% and 3% respectively (Virani et al., 2020). The prognosis for ischemic stroke is generally better than that for hemorrhagic stroke, particularly in the acute phase (Balami & Buchan, 2012). This study aims to evaluate and compare the procedures provided for stroke patients in intensive care units (ICUs) of public hospitals in western Libya, focusing on their socio-demographic characteristics, types of strokes, and critical management procedures.

The study involved a retrospective analysis of clinical records from 600 stroke patients admitted for intensive neurologic rehabilitation. The demographic data revealed that the majority of patients were male, with an average age of 62.75 years for men and 65.54 years for women. This aligns with existing literature that indicates a higher prevalence of stroke in men, although women tend to have worse outcomes due to longer life expectancy and higher rates of comorbidities (Jørgensen et al., 1995).

The study found that 36.7% of patients underwent tracheostomy, and 66.7% utilized nasogastric tubes for nutritional support. These interventions are critical for managing patients with compromised respiratory or swallowing functions. Furthermore, 50% of patients required ventilatory support, indicating the severity of their conditions. Such findings underscore the importance of intensive care procedures in improving patient outcomes, as timely interventions can significantly impact recovery trajectories (Winstein et al., 2016).

The study identified several complications associated with stroke, including cardiorespiratory failure (41.7%), acute thrombophlebitis (23.3%), and extreme hypertension (71.7%). These complications can severely affect recovery and highlight the need for comprehensive management strategies that address both the primary stroke event and secondary complications (Paolucci et al., 2003). The presence of cerebral edema (42.4%) and progressive stroke (32.6%) as common secondary injuries further emphasizes the complexity of stroke management in ICU settings.

The findings suggest that while ischemic strokes are more prevalent, hemorrhagic strokes may lead to different recovery patterns. Previous studies have shown mixed results regarding recovery outcomes, with some indicating better recovery in hemorrhagic stroke patients, particularly in rehabilitation settings (Kelly et al., 2003). This study adds to the body of evidence suggesting that early rehabilitation efforts are crucial, especially within the first 3-6 months post-stroke (Kitago & Ratan, 2017).

The implications of this study for rehabilitation practices are significant. The data suggest that gender differences play a role in stroke outcomes, which may necessitate tailored rehabilitation strategies. Ongoing research is essential to understand how gender influences recovery and to develop interventions that address these differences (Fogelholm et al., 2005). Additionally, the study recommends further exploration of the effectiveness of various intensive care procedures, such as tracheostomy and nasogastric feeding, to optimize management strategies for stroke patients.

The study concludes with several recommendations for future research. First, it suggests investigating the relationship between gender and stroke outcomes, including mortality rates and quality of life post-stroke. Understanding these dynamics can inform treatment and rehabilitation strategies tailored to individual patient needs (Wei et al., 2010). Second, future studies should focus on identifying risk factors

for specific stroke types in diverse demographic groups, which can aid in implementing preventive measures (Lee et al., 2015). Lastly, assessing the impact of complications on patient outcomes can help healthcare providers develop effective strategies to manage these issues and improve overall care for stroke patients.

Conclusion

In summary, this study offers a detailed examination of the procedures and outcomes for stroke patients in ICUs in western Libya, shedding light on critical aspects of stroke management and recovery. The findings underscore the necessity of ongoing research to advance knowledge in this field, with the ultimate goal of enhancing patient care and outcomes for this vulnerable population. The study highlights the significance of individualized rehabilitation strategies and advocates for a multidisciplinary approach to stroke care that addresses the unique complexities of each patient's condition.

Recommendations

The research recommended that:

1. Further research should examine how gender affects stroke outcomes, including mortality, disability, and quality of life, to tailor treatment and rehabilitation for men and women.
2. Future studies should assess the effectiveness of various intensive care procedures (e.g., trachea suctioning, nasogastric tubes, PEG, and ventilator use) in stroke patients to enhance management strategies in critical care settings.
3. Research should identify risk factors for hemorrhagic and ischemic strokes across different demographic groups, enabling healthcare providers to implement targeted preventive measures.
4. Investigations must focus on the impact of stroke-related complications (e.g., cardiorespiratory failure, thrombophlebitis, and hypertension) on recovery, with an aim to develop effective prevention and management strategies.

References

[1] Balami, J.S. & Buchan, A.M., 2012. Complications of intracerebral haemorrhage. *Lancet Neurology*, 11, pp.101–118.

[2] Fogelholm, R., Murros, K., Rissanen, A., et al., 2005. Long term survival after primary intracerebral haemorrhage: A retrospective population-based study. *Journal of Neurology, Neurosurgery & Psychiatry*, 76, pp.1534–1538.

[3] Kelly, P.J., Furie, K.L., Shafqat, S., et al., 2003. Functional recovery following rehabilitation after hemorrhagic and ischemic stroke. *Archives of Physical Medicine and Rehabilitation*, 84, pp.968–972.

[4] Kitago, T. & Ratan, R.R., 2017. Rehabilitation following hemorrhagic stroke: Building the case for stroke-subtype specific recovery therapies. *F1000Research*, 6, 2044.

[5] La Pira, B., Singh, T.D., Rabinstein, A.A. & Lanzino, G., 2018. Time trends in outcomes after aneurysmal subarachnoid hemorrhage over the past 30 years. *Mayo Clinic Proceedings*, 93, pp.1786–1793.

[6] Lee, K.B., Kim, J.S., Hong, B.Y., et al., 2015. The motor recovery related to brain lesion in patients with intracranial hemorrhage. *Behavioral Neurology*, 2015, 258161.

[7] Paolucci, S., Antonucci, G., Grasso, M.G., et al., 2003. Functional outcome of ischemic and hemorrhagic stroke patients after inpatient rehabilitation: A matched comparison. *Stroke*, 34, pp.2861–2865.

[8] Virani, S.S., Alonso, A., Benjamin, E.J., et al., 2020. Heart Disease and Stroke Statistics-2020 Update: A Report from the American Heart Association. *Circulation*, 141, pp.e139–e596.

[9] Wei, J.W., Heeley, E.L., Wang, J.G., et al., 2010. Comparison of recovery patterns and prognostic indicators for ischemic and hemorrhagic stroke in China: The ChinaQUEST Registry study. *Stroke*, 41, pp.1877–1883.

[10] Winstein, C.J., Stein, J., Arena, R., et al., 2016. Guidelines for adult stroke rehabilitation and recovery: A guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*, 47, pp.e98–e169