

Reasons for Delay in Presentation of Acute Stroke Patients in Tertiary Health Centre in Abuja

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Abstract

Original Research Article

Background: Stroke is a life-threatening condition which continues to be a major public health problem leading to death and severe neurologic disability. The time of presentation remains a crucial for the use of intravenous thrombolysis. This study aims at evaluating the time to presentation of acute stroke and the factors that affect this time, and see if efforts could be made to reduce delay to enhance therapeutic intervention. **Methods:** This cross-sectional study was carried out with a total of eighty-two consecutive patient admitted into the medical wards. All patients had full clinical assessment and investigations, including demographic aspects, Prior and source of knowledge of stroke warning symptom, means of transportation to the hospital and duration before presentation and possible reasons for delay. Data collected was analysed by frequency, mean, standard deviation and chi-square test. **Results:** Of the 82 study participants, 50% had Cerebral infarction, 34.1% intracerebral hemorrhage, and 15.9% subarachnoid hemorrhage. Those with previous knowledge of one-sided weakness were 78% and difficulty with speech were 54.9% among the stroke warning symptoms. About 33% presented before 4 hours while 50% of patient presented between 6 to 11 hours. Only 3.66% used ambulance service to the hospital. Among the possible reason for delay 45.1% were not aware of the dangers of delayed treatment and 40.2% complain of distance to the hospital. **Conclusion:** Our study though hospital-based, has been able to highlight unawareness of the dangers of delayed treatment and distance to the hospital as major factors contributing to prehospital delay which are obviously modifiable.

Keywords: Stroke, Delay and risk factors.

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BACKGROUND

Stroke is a life-threatening condition which continues to be a major public health problem leading to death and severe neurologic disability. In Nigeria study, Stroke constituted about 2.4% of all emergency admissions with cerebral infarction making up 49% of all cases [1]. Studies have shown that intravenous thrombolysis is the treatment of choice when patients present early within 3 or 4.5 hours of onset [2]. Studies have also shown that permanent neurological damage may result if cerebral ischemia persists after 6 hours [3].

It is noteworthy that the time between presentation to the emergency unit and onset of symptom is remains a crucial criterion for the use of intravenous thrombolysis and maximizing the benefit of stroke intervention [4].

Studies have shown that several factors affects the time interval [5-9], and therefore that if delays are

improved upon a large number of patients would be eligible for intravenous thrombolysis [10, 11].

Delay in the emergency care is further compounded by expertise needed to diagnose and further evaluate the patient so as to start therapy. Other delays may come from non-availability of neuroimaging facilities and poor hospital referrals to the appropriate physician/neurologist.

The aim of the present study was to evaluate the time to presentation at the emergency unit in patients who suffer an acute stroke and the factors that affect this time, and see if efforts could be made to reduce this delay in time to enhance therapeutic intervention.

Methodology Study Location and Data Collection

This cross-sectional study was carried out at the University of Abuja Teaching Hospital, a tertiary health centre, from March 2022 and July 2023. A total of eighty-two consecutive patient admitted into the medical

wards who met the inclusion criteria had structured questionnaire administered to and their caregivers. Stroke patient who were confirmed clinically using WHO criteria and radiologically by cranial computed tomography scan or MRI were included in this study.

All patients had full clinical assessment and investigations. The questionnaire presented had questions about: (1) Demographic aspects (gender, age, income and educational level) (2) Prior knowledge of stroke warning symptom (3) Source of knowledge (4) Duration before presentation at the hospital (5) Means of transportation to the (6) Possible reasons for delay in presentation

Our time of stroke onset was taken as the time symptoms were noted by the relative or the patient. For those patients who woke up with neurological deficits, the time of stroke was taken as the time of awareness of symptoms on awakening. Therefore, the time of presentation was taken to be the time of initial contact with medical personnel at the hospital (Including the time presentation if from reference hospital).

Inclusion Criteria: All patients who were admitted into the medical ward with confirmed stroke. All patients had full clinical assessment for stroke screened clinically by WHO criteria and verified radiologically by cranial computer tomography scan were included in the study.

Exclusion Criteria: Patients who had space occupying lesion with neurological deficits or metastatic brain disease and those with Human Immunodeficiency Virus with neurological deficits were excluded from this study. Excluded from this analysis were patients who had transient ischemic attacks, those who developed symptoms while hospitalized for another condition.

Data Analysis

Statistical analysis of data collected was performed using Analyse-it v4.5 statistical software for Microsoft Excel. Data collected was analysed by frequency, mean, standard deviation and chi-square test. For all statistical tests, the threshold of significance is fixed at 5%. P-value>0.05 indicates none significant results.

RESULTS

Table 1 shows the characteristics of study participants

Of the 82 patients, 53 (64.4%) were men, while the female were 29(35.4%). Mean age was 54.5+ 10.7 years. Those with formal secondary education were 25(30.5%) and those with tertiary were 40(48%). Forty-one patients (50%), had cerebral infarction, 28 (34.1%) intracerebral hemorrhage, and 13 (15.9%) subarachnoid hemorrhage. Those with tertiary education were 48.8% of the study population, while 30.5% had secondary education.

Table 1: Characteristics of Participants

Characteristic	All (n=82)
Age group, y	
15-20	1 (1.2)
21-30	9 (11.0)
31-40	18 (22.0)
41-50	23 (28.0)
>50	31 (37.8)
Sex, n (%)	
Men	53 (64.6)
Women	29 (35.4)
Marital status, n (%)	
Single	3 (3.7)
Married	66 (80.5)
Separated	1 (1.2)
Divorced	0 (0.0)
Widowed	12 (14.6)
Educational status, n (%)	
No formal education	5 (6.1)
Primary	12 (14.6)
Secondary	25 (30.5)
Tertiary	40 (48.8)
Occupational status, n (%)	
Civil servant	29 (35.4)
Self-employed	31 (37.8)
Schooling	0 (0.0)
Unemployed	22 (26.8)
Stroke type	
Ischaemic	41 (50.0)
Haemorrhagic	28 (34.1)

Characteristic	All (n=82)
Subarachnoid	13 (15.9)
*Age, years	54.5 (10.7)
[†] Interval between onset of symptom and presentation at hospital, hours	5 (2-8)

*Mean (standard deviation), [†]Median (interquartile range)

Figure 1 which represents the previous knowledge of stroke warning symptoms/signs shows that, sudden onset one sided weakness (78%) is most

known warning sign for stroke by respondents. Difficulty with speech was 54.9% and facial deviation was 45.1%.

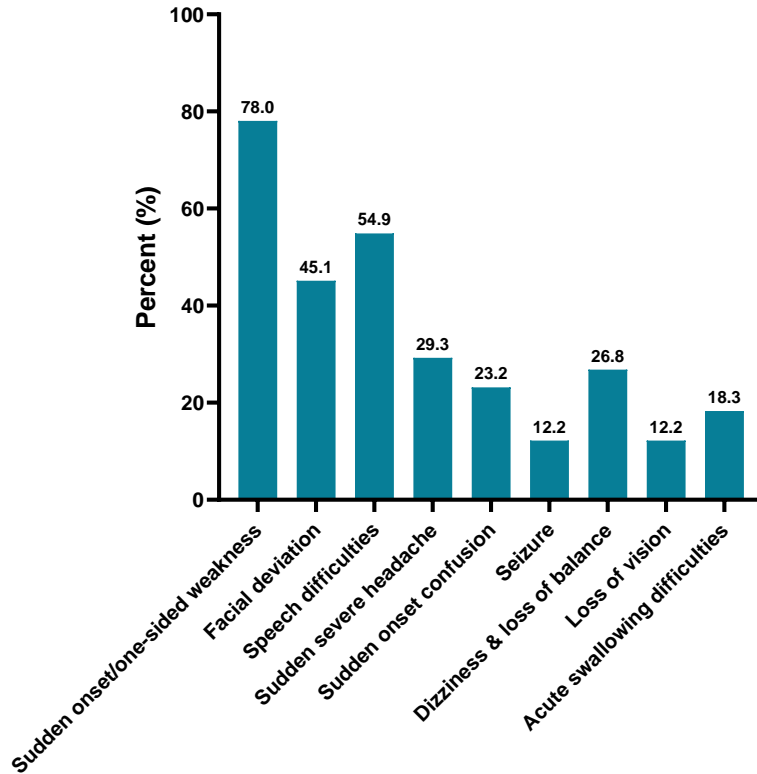


Figure 1: Prior knowledge of stroke warning symptoms/signs

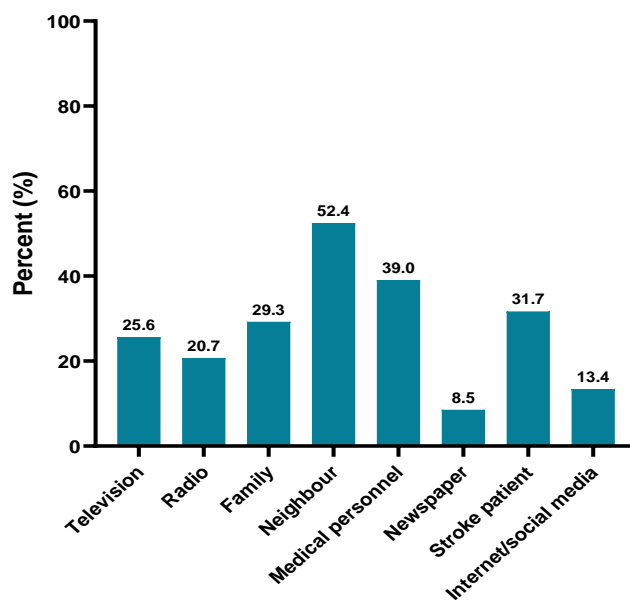


Figure 2: Source of knowledge

Figure 2 which represents source of stroke knowledge, showed that 52.4% got to know about Stroke from neighbours, while 39% learnt about stroke from

medical personnel and 31% from previous stroke patients.

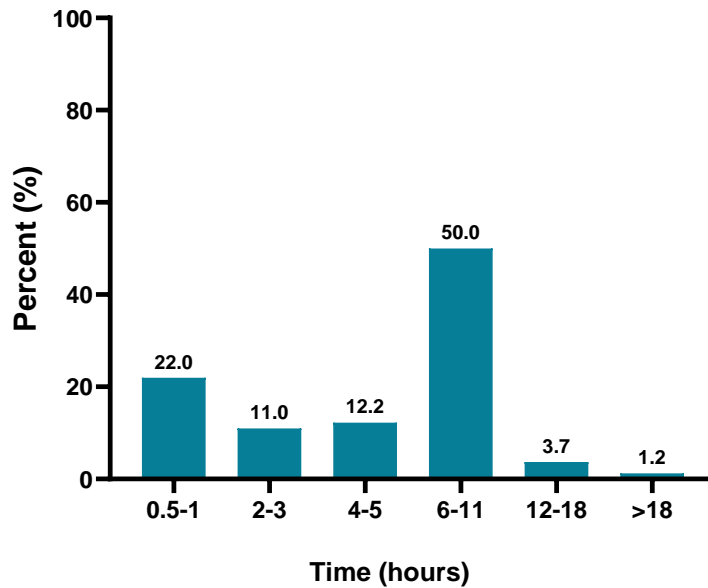


Figure 3: Duration before presentation at the hospital

Figure 3 shows the time from symptom awareness to presentation in the hospital. Fifty percent of patient presented between 6 to 11 hours.

33% came before 4 hours. (This figure included those who presented to the private hospital). Even though 45.2% presented to the hospital, the quality of Stroke care can not be ascertain, thus leading to referral to the teaching hospital.

The results show that 45.2% of the patient came before 6 hours. However a closer look showed about

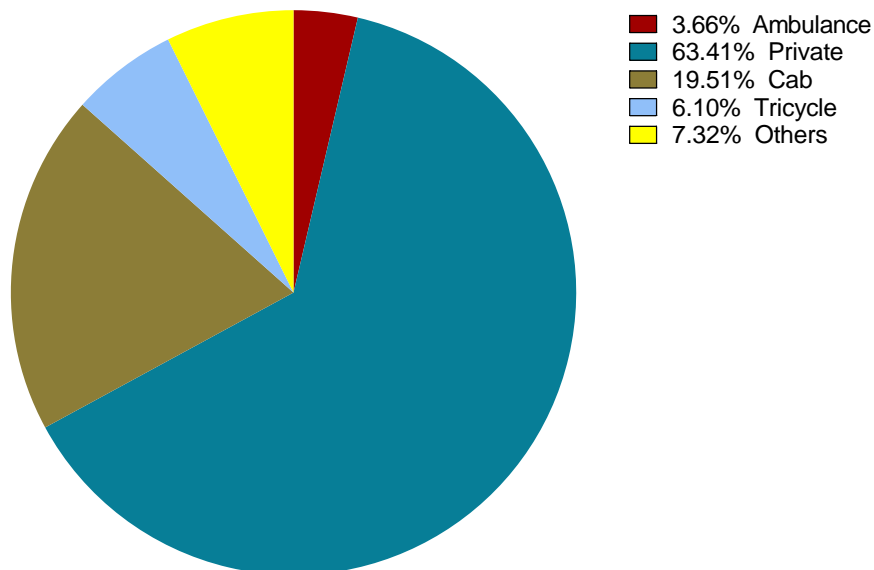


Figure 4: Means of transportation to the hospital

Figure 4 displays the means to transportation to hospital which showed that majority of patients used their private vehicle (63.41%) as means to get to the

hospital. The use of ambulance service was very low (3.66%) where initial treatment would have begun.

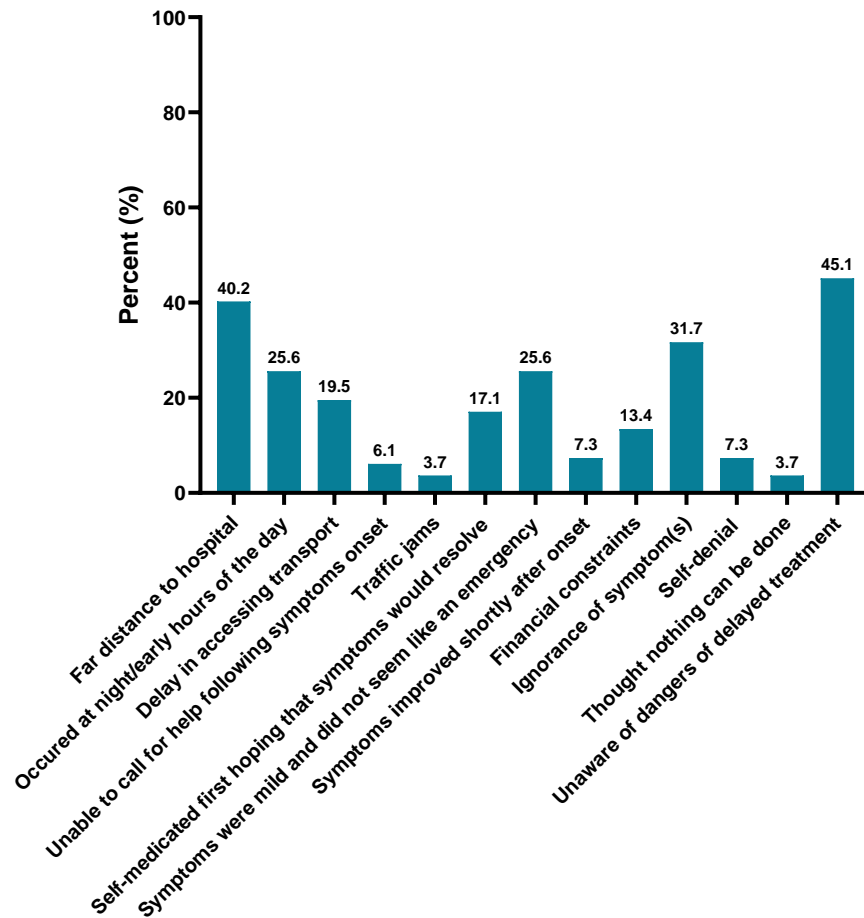


Figure 5: Possible reasons for delay in presentation

Figure 5 represents the possible reason for delay in hospital presentation, 45.1% were not aware of the dangers of delayed treatment. About 40.2% of the respondent said the distance to the hospital was responsible for the delay. The next three reason are closely interwoven, about 31.7% were ignorant of stroke symptoms hence did come early to the hospital, while 25.1% felt the symptoms were mild and did not require emergency attention and 25.6% felt it occurred at night or early hours of the morning.

About 19.1% had delayed access to means of transportation to the hospital.

DISCUSSION

Our study assessed the reason for delay in presentation to the hospital, average time of arrival after a stroke and means of transport to the hospital, as well as knowledge of stroke symptoms and signs. The study found the mean age of patients to be 54.5 ± 10.7 years and shows a preponderance of males among the study population thus reflecting an overall male sex predisposition to stroke. The males among the patient population were 64.6% while the females under study were 35.4%. Previous studies from China and India reported mean age of similar pattern of 58 years and 64 year respectively [12, 13] and that older age is important

risk factor for stroke [14, 15]. The male predominance has also been shown in previous studies [16, 17]. Stroke rate has been found to more than double after age 55 years for each successive 10 years [18, 19]. Although stroke incidence rates are 1.25 times greater in men, more women than men die of stroke each year and this has been attributed to the probable fact that women tend to live longer than men [20].

The most common warning symptom identified for stroke in our study was one sided weakness (78%), followed by difficulty in speech which was 54.9%. This is slightly lower than previous works done by Alkadry *et al.*, among rural residents in West Virginia had 92% of respondents with one sided weakness of face or arm or leg and difficulty in speech 88% [21], Segura *et al* in Spain also had 88% and 80% [22] respectively and Onwuegbuzie *et al.*, who found 84% and 69% respectively [23]. This however is in contrast to the work done by Wahab *et al.*, done in Irrua, Nigeria showed that weakness of one side was 24.4% [24], while the work done by Komolafe *et al.*, in Osun state, Nigeria found weakness (51.9%) as the most commonly identified warning sign of stroke among the adolescent students [25]. Nevertheless, other less common warning sign are important as that will enhance identification of stroke

symptoms and hence the critical referral for emergency care.

Our study results show that 33% of the patient came before 3 hours. (This figure included those who presented to private hospital). However, a closer look showed delay in presentation of about 67% who came after 3 hours of symptom onset. Fifty percent of patient presented between 6 to 11 hours. Previous studies have shown that the ideal recommended time to present an acute stroke patient to hospital is within 3 hours [26, 27]. Similar studies done in other low and middle-income countries, showed a high prevalence of prehospital delay. Ekeh *et al.*, in Nigeria reported prevalence of 89.2% [28], Seremwe *et al.*, found a prevalence of 90.9% [29] and in South African study about 87% presented after 4.5 h of symptom onset [30]. Several studies from Asia showed similar prehospital delay pattern among patients with acute stroke. Zhou *et al.*, in central urban China reported a prevalence of 69.3% [31], Nepal *et al.*, found prevalence of 85.7% [32], and Iyer *et al.*, and Pandian *et al.*, in India reported 79.8% and 71% respectively [33, 34]. The reason for slightly higher figure of 33% in our study may be due to the cosmopolitan nature of the study centre located in Abuja, the capital of Nigeria.

The means of transportation to hospital in resource limited countries has remained a major challenge, where emergency evacuation is nearly non-existent. This will serve as a source of delay in acute care management. In our study only 3.7% used ambulance service to the hospital, while 63.4% used their private vehicles and 6.1% used tricycle as means of transportation. Previous studies conducted showed that in the use of emergency ambulance services was an efficient and most suitable mode of transportation to hospital after an acute stroke [28, 34-36].

The possible reason for delay in hospital presentation varies with study setting and the economic state of the country (low, middle or advanced economy). In our study as much as 45.1% were not aware of the dangers of delayed treatment. About 40.2% of the respondent said the distance to the hospital was responsible for the delay. Previous studies have found distance to the hospital as a reason for delay [2, 31, 37]. The next three reason are closely interwoven, about 31.7% were ignorant of stroke symptoms hence did come early to the hospital, while 25.6% felt the symptoms were mild and did not require emergency attention and 25.6% felt it occurred at night or early hours of the morning. This is consistent with previous studies which has shown that patients with milder symptoms have a longer time delay in hospital presentation/admission [38-41]. Furthermore, studies have shown that if symptoms of the Stroke started with differential weakness of one side or speech impairment there were more likely to identify the symptoms as a stroke warning sign opposed to other symptoms, therefore leading to delay in presentation. 21-23 Our study found that those whose symptom occurred

at night were likely to have pre-hospital delay compared to those whose symptoms occurred during the day, which is consistent with previous studies, and which showed that patients with nighttime-onset stroke were more likely to have a prehospital delay for stroke evaluation [42-44]. Conversely this was not the case in other studies, which found nighttime onset not to be associated with prehospital delay [45-49], while Iguchi *et al.*, suggesting that night onset independently contributed to early hospital arrival [50]. Our study also found that 17.1% had self-medication hoping symptoms will resolve, this practice is seen in rural setting in developing country like Nigeria where access to care may be difficult coupled with economic challenges.

CONCLUSION

In conclusion with better understanding of cerebral revascularization this study has brought to the lamplight reasons for hospital delay after stroke since healthcare organization differ among communities. Our study, though hospital based has been able to highlight that being unaware of the dangers of delayed treatment and distance to the hospital as major factors contributing to prehospital delay. Thus, efforts could be made to reduce this delay time to enhance therapeutic intervention.

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