Research Article

Profile of Neurologic Emergencies At The Accident & Emergency Department of A Tertiary Hospital in South Nigeria

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Summary

Neurological emergencies are a frequent presentation and often times with devastating short and long term consequences. There is paucity of data on adult neurological emergencies in Nigeria. The profile of patients with neurological emergencies has not been reported in our hospital. A retrospective study of neurological patients attending the emergency department was performed over a one-year period. Neurological emergencies accounted for 25.7% (284) of the total medical emergencies. The most common diagnoses were stroke (52.5%), meningoencephalitis (11.3%) and hypertensive encephalopathy (7.0%). Majority of the neurological patients were males, constituting 56.7%. Neurological emergencies were found to be common in the emergency room. There is need for the establishment of a specialised neurological emergency unit in the emergency department.

Key words: Clinical profile, neurological emergencies, Nigeria

INTRODUCTION

Acute neurologic disorders are common, constituting a significant proportion of neurologic emergencies in the emergency room(15,41). The profile of neurologic cases presenting in the emergency unit differs from one country to another and varies among regions even in the same country. In some hospitals, headache remains the main cause of emergency neurologic visits(20) while in most, cerebrovascular events top the list(14,40). The organization and management of neurologic emergencies also vary among hospitals. While some hospitals run an interdisciplinary emergency unit with...
consulting neurologists in attendance when called, others have specialized neurological emergency units. In most, a neurologist is not available and patients that have neurological conditions are attended to by other primary care physicians like Internists, Family physicians and emergency care physicians.

In the United States, on yearly basis, millions of Americans are reported to suffer an acute stroke, severe traumatic brain, subarachnoid haemorrhage, status epilepticus or spinal cord injury severe enough to warrant medical intervention\(^{(5,6,7,39,49,50)}\). In Sub-Saharan Africa, although neurological emergencies are common, there is paucity of data on the subject. This has been mainly due to poor record keeping and low reporting/presentation to hospitals due to cultural beliefs/myths about the disease and eventual outcome including stigmatization\(^{(4,21,44)}\). In spite of this, neurological emergencies requiring intensive care management have been frequently reported in Nigeria\(^{(1,32,38)}\).

At the University of Calabar Teaching Hospital, a tertiary health institution, the profile of patients presenting with neurologic emergencies has not been studied prior to this time. The objective of this study was therefore to determine the pattern of neurologic emergencies presenting at the emergency unit of the hospital. It is hoped the data will help identify priorities among neurological patients and prepare the hospital to better management of such cases.

**MATERIAL AND METHODS**

A retrospective review of the register in the emergency department of the University of Calabar Teaching Hospital was carried out between January 2010 and December 2010. The University of Calabar Teaching Hospital is a tertiary health institution located in Calabar, the capital of Cross River State in South South, Nigeria. The capital has a population of 371,022 based on the 2006 population census\(^{(27)}\). The hospital receives patients mainly from other parts of the state and Akwa Ibom State. Patients also come from the neighbouring states of Abia, Benue and Rivers while some come from the Republics of Cameroon and Equitorial Guinea that bound Cross River state, Nigeria. The accident and emergency department provides emergency care for adults patients 24 hours a day. It runs an interdisciplinary emergency unit where medical emergencies are attended to by internal medicine specialists, family physicians, surgeons and other allied medical professionals. A specialized neurological emergency unit is non-existent in this hospital for now.

All neurological emergencies admitted into the hospital within the study period were evaluated. Inclusion criteria for the study were patients with neurological problems who were 16 years and older. Exclusion criteria were non-neurological medical cases and neurosurgical emergencies. Data extracted from the case files included age, sex and confirmed diagnosis. The data was analysed using the Epi Info software. Results were presented in simple frequency table proportions.

**RESULTS**

During the study period, there were 1104 medical emergencies seen at the Adult Emergency unit, out of which 284 (25.7%) were neurological emergencies. There were 161 males and 123 females, giving a male: female ratio of 1.3:1. The ages of the patients ranged from 16 to 95 years with a mean age of 49.76 years and the median age of 50 years. The ages of the patients were not documented in 12 of the cases. The age distribution is as shown in Table 1.

Table 2 shows the pattern of neurological illness in the study population.

Stroke was the most frequent neurologic emergency and was identified in 149 (52.5%) patients, with 85 (57%) of these patients being male while 64 (43%) were
females. The ages of three of the male patients and two of the female patients were not recorded in the register. Among the female group, those that were less than 45 years of age were 16 (25.8%) while those that were over 45 years were 46 (74.2%). The mean age of the female patients was 56.5 years. The median age was 60 years. In the male group, those who were less than 45 years were 17 (20.7%) and those that were over 45 years were 65 (79.3%). The mean age was 56.9 years and the median age was 55 years. The total percentage of the stroke patients that were under 45 years of age was 22.9%; while those over 45 years of age constituted 77.1%.

The second most common diagnosis was meningoencephalitis which was found in 32 (11.3%) patients. Hypertensive encephalopathy was present in 20 (7%) patients. HIV encephalopathy was the fourth most frequent neurologic emergency and was detected in 15 (5.2%) patients.

Epilepsy (0.7%), Parkinson's disease (0.7%) and Guillain-Barre syndrome (0.35%) were uncommon. Other neurological emergencies encountered are as listed in Table 2.

Table 1: Age distribution of the patients with neurological emergencies

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-25</td>
<td>27</td>
<td>9.5</td>
</tr>
<tr>
<td>26-35</td>
<td>39</td>
<td>13.7</td>
</tr>
<tr>
<td>36-45</td>
<td>46</td>
<td>16.2</td>
</tr>
<tr>
<td>46-55</td>
<td>49</td>
<td>17.3</td>
</tr>
<tr>
<td>56-65</td>
<td>64</td>
<td>22.5</td>
</tr>
<tr>
<td>66-75</td>
<td>33</td>
<td>11.6</td>
</tr>
<tr>
<td>76-85</td>
<td>11</td>
<td>3.9</td>
</tr>
<tr>
<td>86-95</td>
<td>3</td>
<td>1.1</td>
</tr>
<tr>
<td>Unknown ages</td>
<td>12</td>
<td>4.2</td>
</tr>
<tr>
<td>Total</td>
<td>284</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 2: Pattern of neurological diseases seen at the Accident and emergency department

<table>
<thead>
<tr>
<th>Neurologic Emergency</th>
<th>Number of patients</th>
<th>Percentage(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>149</td>
<td>52.5</td>
</tr>
<tr>
<td>Meningoencephalities</td>
<td>32</td>
<td>11.3</td>
</tr>
<tr>
<td>Hypertensive Encephalopathy</td>
<td>20</td>
<td>7.0</td>
</tr>
<tr>
<td>HIV Encephalopathy</td>
<td>15</td>
<td>5.2</td>
</tr>
<tr>
<td>Hepatic encephalopathy</td>
<td>5</td>
<td>1.8</td>
</tr>
<tr>
<td>Uraemic encephalopathy</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Neuropathies</td>
<td>13</td>
<td>4.5</td>
</tr>
<tr>
<td>Tetanus</td>
<td>12</td>
<td>4.2</td>
</tr>
<tr>
<td>Transient Ischaemic attack</td>
<td>9</td>
<td>3.2</td>
</tr>
<tr>
<td>Seizure disorders</td>
<td>8</td>
<td>2.8</td>
</tr>
<tr>
<td>Myelopathy</td>
<td>7</td>
<td>2.5</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Parkinson’s disease</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Pott’s disease</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Vertigo</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Bell’s palsy</td>
<td>1</td>
<td>0.35</td>
</tr>
<tr>
<td>Guillain -Barre syndrome</td>
<td>1</td>
<td>0.35</td>
</tr>
<tr>
<td>Intracranial neoplasm</td>
<td>1</td>
<td>0.35</td>
</tr>
<tr>
<td>Syncope</td>
<td>1</td>
<td>0.35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>284</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

DISCUSSION

This study has demonstrated that neurological emergencies accounted for 25.7% of the total medical emergencies seen in our centre in Calabar, Nigeria. This figure was higher than that reported in France where neurologic emergencies accounted for 15% of medical emergencies\(^{11}\) and in Spain where neurological emergencies were observed to account for 10-15% of the medical emergencies\(^{9}\). In Nigeria, while there are several reported studies of neurological emergencies in children\(^{18,28,38}\), there is paucity of data on neurological emergencies in the adult population. Most studies have been focussed on medical emergencies\(^{34,36}\).

The mean age of the patients with neurological emergencies was 49.76 years. Other studies in Spain and France had reported the mean age of those with neurological emergencies to be 59 years and 56.9±21 years respectively\(^{13,26}\). Yet in another study in India, the mean age of those with neurologic emergencies, 37.4± 19, was found to be lower than that noted in our study\(^{43}\). The highest peak age range of neurological emergencies in our study was between 56 years to 65 years. This is mostly contributed from stroke which is most frequent in the elderly\(^{10,24}\).

Most of our patients were males. This agrees with a study carried out in India that also observed a male preponderance of 63% among those with neurological emergencies\(^{43}\). But contrasts with earlier studies where most of the patients were...
females\textsuperscript{(13,23)}. And yet in another Spanish study, no sex difference was observed\textsuperscript{(14)}. It is thought that the hormonal differences especially estrogen may be protective to the women.

In our study, stroke was observed to be the most frequent neurologic condition in the emergency room, accounting for more than half of the total neurologic emergencies. This is in conformity with previous studies that observed stroke to be the most common neurologic emergency\textsuperscript{(23)}. Stroke was found to be commoner in those over 45 years in both sexes. Age has been observed to be strongly associated with stroke. In a study by Walker et al in Tanzania, stroke incidence was markedly increased for males than females in the age band of 55-64 years, 65-74 years, and 75-84 years in Hai rural area\textsuperscript{(48)}. Stroke was also observed in the present study to be more frequent in males than females. This is in agreement with earlier studies that found stroke to be commoner in males than females\textsuperscript{(3,19,51)}. Onwuekwe et al had also observed a male preponderance among CT confirmed stroke cases, with a male to female ratio of 2.55:1\textsuperscript{(35)}. The literature concerning sex-specific aspects of cerebrovascular diseases is scanty. Females are usually many years older than males when the first stroke occurs\textsuperscript{(51)}. This sex difference in stroke has been hypothesized to be related to sex hormones, mainly oestrogen in females which are thought to be protective.

The three most common neurologic emergencies in our study were stroke (52.5\%), meningocencephalitis (11.3\%), and hypertensive encephalopathy (7\%). Carroll and Zajicek working in Plymouth, United Kingdom, had found stroke, headache and seizures (29\%, 13\%, and 12\% respectively) to be the three most frequent neurologic emergencies\textsuperscript{(8)}. In a study by Garcia-Ramos et al\textsuperscript{(14)}, stroke topped the list of the neurological emergencies accounting for 24.57\% of the cases, with epilepsy (13.06\%) as the second most common condition while headache emerged third (6.07\%). Casado in Spain had equally found stroke, headache and epilepsy to be the most frequent neurologic disorders in the emergency room\textsuperscript{(5)}. In another Spanish study, headache was the main reason for visits to the emergency neurologic department\textsuperscript{(20)}. No patient presented with headache as an emergency in our study. The possible reason why headache was rare in our study could be due to the fact that our population underestimates the significance of headache. Patients often prefer over-the-counter drugs and sometimes home remedies including herbs thinking it could be malaria fever. The patients thus present only when the headache has evolved into a more serious condition.

In our study, central nervous system (CNS) infections ranked second as the commonest neurologic emergency with meningocencephalitis being the most frequent. In a similar study carried out by Chapp-Jumbo in Port Harcourt, Nigeria, central nervous system infections equally ranked second as the most frequent neurologic condition\textsuperscript{(10)}. This contrasted with an earlier study carried out in the 1970s by Osuntokun in Ibadan, Nigeria, where CNS infections were found to be the commonest neurologic condition\textsuperscript{(37)}. Kwasa in Kenya in early 1990s had also observed central nervous system infections, mainly meningitis, to be the most frequent neurologic disorder\textsuperscript{(22)}. This shows the changing pattern of neurologic disease with non- communicable diseases especially stroke topping the list.

Although Nigeria is one of the countries in the meningitis belt; meningitis tends to affect people in the northern part of the country with more reported outbreaks than those in the southern part where this study was carried out\textsuperscript{(17,25)}. This might not be unconnected with the different climatic conditions in the country as variability in weather and climate has been observed to
influence infectious disease outbreak and spread\(^{(45)}\). A previous study conducted by Ogunlesi et al in Ilesa, western Nigeria, showed the incidence of meningitis to be lower than that reported in northern Nigeria which sits in the meningitis belt of Sub-Saharan Africa\(^{(30)}\). In addition, housing conditions are generally better in the study area than the northern part of the country where housing is largely overcrowded with poor ventilation\(^{(45)}\), predisposing to fast spread of infectious diseases. Calabar, in south south Nigeria where this study was carried out, is located along the Atlantic coast at about 200 meters above sea level, and located between latitudes 5.55°N and 5.58°N and longitudes 8.15°E and 8.22°E\(^{(29)}\). This is outside the meningitis belt of West Africa and this may account for the low incidence of meningoencephalitis in our study.

Intracranial tumours were rare in our study and accounted for 0.35% of the total neurologic emergencies. This might have been due to a low index of suspicion and the lack of a CT scan then, for screening of suspected cases especially those with seizure disorders. Idowu et al in Western Nigeria had reviewed the histological request forms of 113 consecutive patients with symptomatic primary intracranial tumours over a 6 year period proving that intracranial tumours are not that uncommon in Africans\(^{(16)}\). The very low frequency observed in our study may also be related to the difference in the study period. Other neurologic disorders that were rare in our study were syncope, Bell's palsy, and Gullaine-Barre syndrome.

Myasthenia gravis was also rare in our study. Few of the cases seen at the medical outpatient department were usually referred by the ophthalmologists. They rarely present in our facility as emergency cases. The reason for this is not known. Myasthenia gravis was not reported as one of the common medical emergencies in an earlier study carried out by Opara et al in the study area\(^{(36)}\). Also in Nigeria, Ojini et al had observed an infrequent presentation of myasthenia gravis at the neurology clinic\(^{(31)}\). This was in contrast with previous studies that reported cases of myasthenia gravis presenting in the emergency department\(^{(42,47)}\). In India, 841 cases of myasthenia gravis were seen over a 43 year study period\(^{(46)}\).

Epilepsy and seizure disorders were also not very common in our study. This was at variance to a study carried out by Huff et al where seizure disorders were common in the emergency room\(^{(15)}\). Parkinson's disease was also not common, contributing to about 0.7% of the neurological emergencies. This agrees with an earlier study where movement disorders represented a small percentage of neurological emergencies\(^{(12)}\). The low prevalence of epilepsy and seizure disorders, along with Parkinson's disease in our study may be related to fear of stigmatization. In Nigeria, most cultures believe that these conditions run in families and are inherited. The conditions are also thought to be due to anger from the ‘gods' and the curse which may follow such families may include infertility\(^{(2,21,44)}\). Consequently, any family identified with such conditions may be avoided in all ramifications including marriage. Even at schools, these persons and children may be scorned and laughed at leading to withdrawal and in extreme cases, depression. These reasons negate against hospital presentation causing the patients to hide and stay away from treatment and help.

A worrisome finding in this study is that of documentation. It was noted that 12 (4.2%) patients had no full documentation especially their ages. This can affect demographic distribution of the cases.

**CONCLUSION**

Patients presenting with neurologic emergencies are common in the emergency room. Stroke, meningoencephalitis and hypertensive encephalopathy were the most common presentations. Socio-cultural
issues like stigmatization may be major impediments to presentation of other neurological emergencies like epilepsy and seizures. It is necessary to consider the establishment of neurological emergency unit while intensifying public health education against stigmatization of persons with some of the neurological conditions like epilepsy and seizure disorders.

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