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Pattern and Influence of In-Patient Neurological Consultations in a Nigerian Tertiary Health Institution: A Brief Survey

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Patients with neurological disorders are frequently admitted by non-neurologist; hence neurological consultations are commonly requested for. Whether these consultation services are beneficial to patients' diagnostic and management process is yet to be determined in our environment in Nigeria. We audited the neurological ward consultation and its influence on patients' diagnostic and management process at the Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun state, Nigeria. Neurological hand written consults received between December 1, 2008 and February 28, 2009(13 weeks) were prospectively collated and analyzed. Case records of the patients were then retrospectively reviewed to determine the influence of each consultation. Fifty-four neurological consultations were reviewed during this period. Consultation rate was about 4-5/week. Cerebrovascular disease was the most common diagnostic category in 26 consults (48%), followed by infections in 10 (18.5 %). Complete takeover of patients' management was the most common reason for the consultations (82.4%). These consultations were beneficial in 35 patients (64.8%). This study augments the evidence for the continuous development of neurology workforce in Nigeria. Neurological consultation was largely beneficial but indiscriminate takeover of patient is a concern as it possibly indicates a low affinity for management of neurological cases by the general physician. There is a need to further access this service and for continuous neurological education of the general physician.

keyword: Diagnoses, In-patient, Management, Neurology, Nigeria, Referral.

INTRODUCTION

Neurological ward consultations -- in which in-patients are reviewed to contribute to the diagnostic or management process -- are basically formal and informal

although other variations consisting of multidisciplinary teams, telemedicine, and computer-based communications (the most notable of which is electronic mail) are becoming increasingly used [1-4]. Consultations have the potential benefits of enhancing physician -to-physician communication as well as identifying important trends and potential over- or underuse of certain types of care. However, the real value of referral rates ultimately

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lies in understanding the impact of specialty expertise on the process and outcomes of care [2,5]. While many diagnostic and treatment strategies have been rigorously evaluated to determine if they improve patient outcomes or lower costs, consultations, however, have generally been infrequently appraised.

Neurological disorders constitute a considerable proportion of medical admissions and are diverse in presentation as well as diagnostic spectrum. In Nigeria, neurological admissions have been found by most studies to constitute between 14-20% of medical admissions [6-9]. Often, these patients are admitted by non-neurologists resulting in request for neurological consultation. However, the overall benefit of the consultation process is unclear in view of the paucity of data across sub-Saharan Africa. An appraisal of the benefits of neurological referral is essential because it provides for better organization of medical services for neurological conditions and improves clinical neurology workforce development [10].

Furthermore, information from such survey could be useful in focusing the neurological education of physicians who assess and refer patients with neurological complaints [10]. It is with this background that we studied the pattern of in-patients' neurological consultation in a tertiary health care facility in southwest Nigeria. The study aimed to ascertain the frequency, sources of, and reasons for in-patients' neurological consultations. We also evaluated the impact of these consultations on patients' diagnoses and management.

MATERIALS AND METHODS

This descriptive study was carried out at the Olabisi Onabanjo University Teaching Hospital Sagamu, Ogun state, Nigeria between December 1, 2008 and February 28, 2009 (13 weeks). The teaching hospital is situated between two major cities (Ibadan and Lagos) and is about 35kilometers from the state capital (Abeokuta). This 251 bedded facility provides tertiary care to the inhabitants of Ogun State primarily, as well as patients from Oyo and Lagos states. Medical in-patients are admitted to the medical wards comprising of 40 beds for both males and females.

During the study period, neurological cases were admitted to these wards and there was no limit to the number of neurological admissions as long as there were un-occupied beds. Two consultant neurologists were in charge of the Neurology Unit of the Medical department. The unit also had a senior registrar in addition to two junior registrars. The junior registrars were in the unit at

different times so; the unit could only dispose of a registrar at any time during this period. Neurological consults were typically requested by the admitting unit and rarely directly from the Accident and Emergency unit. The patients were usually reviewed first by the residents and either of the consultants thereafter. All neurological consults during this period were collected prospectively from all wards.

Socio-demographic parameters were collated as well as the sources of referrals, the purpose of referral and the length of hospital stay before a neurological consultation was requested for. Furthermore, the initial diagnosis of the requesting physician was recorded for each patient. This was compared to the initial diagnosis of the consulting neurologist and to the final diagnosis. In all cases, the final diagnosis was based upon an interpretation of history, physical examination and appropriate diagnostic tests. At the end of the consultation process, all patient records were retrospectively reviewed to determine and verify any change in diagnosis as well as the line of management. Diagnostic categories were allocated according to the survey of Steiger et al. [12]. Informal consultations were excluded. The outcome was also recorded and coded into previously established categories. Steiger et al. and Hillen [12,13] in these outcome categories, the neurologist:

- makes a novel neurological diagnosis where no previous diagnosis existed
- changes an incorrect diagnosis made by the referring physician
- suggests an additional differential diagnosis or diagnoses and /or additional test to narrow down the differential diagnosis
- suggests a treatment plan for the neurological condition.

If the consultation had no impact on patient management; (management impact in this context was defined as additional rational investigations, diagnostic procedures and treatment modalities for the neurological condition in question) the outcome was recorded as 'no definite contribution'. All data were recorded on a pre-designed questionnaire.

The study was approved by the Health Research and Ethics Committee of the Olabisi Onabanjo University Teaching Hospital (OOUTH). The Statistical Package for the Social Sciences (SPSS), version 15 (SPSS Inc., Chicago, IL, U.S.A.) was used for the analyses. Categorical and continuous variables were expressed as percentages and mean (\pm standard deviation). Skewed data were expressed as median (range). Mann-Whitney

Table 1. Frequency table showing the sources of the neurological consults.

Source of neurological consults	Number of consults (%)
Surgery	
General	4(7.4)
Orthopaedics	2(3.7)
Ophthalmology	1(1.8)
Urology	1(1.8)
Pediatrics	2(3.7)
Obstetrics and Gynaecology	4(7.4)
Accident and Emergency	3(5.6)
Medical subspecialties	
Respiratory	9(16.7)
Gastroenterology	1(1.8)
Rheumatology	7(8.8)
Endocrinology	9(16.7)
Nephrology	7(12.9)
Cardiology	4(7.4)
Total	54(100%)

U test was used to assess the difference in the length of hospital stay between patients in the medical and non-medical wards.

RESULTS

There were 223 total medical admissions in total during this period of which 82(36.7%) were neurological cases (defined as primary central and/or peripheral nervous system disorders). Fifty-four patients (including in-patients of other non-medical wards) had neurological consultation during this period. The consultation rate was 4-5 per week. The mean age of the patients was 51.8 ± 18.9 years (range 15-85), of which 25 were females (46.3%) while 29(53.7%) were males. The median length of hospital stay for the patients before a consult was requested was 3 days (range 1-28 days). There was no significant difference between the median lengths of hospital stay preceding a consultation among patients in the medical (4 days, range 1-10 days) and non-medical (2 days, range 1-28 days) wards ($p=0.151$). The sources of neurological consults are detailed in table 1.

Complete takeover of patients' management was the reason for the request in 45 (83.3%) consults while co-management and a second opinion was requested for in 6(11.1%) and 3(5.6%) consults respectively. Cerebrovascular disease was the most common diagnostic category, accounting for 26 (48.1%) of the cases seen. CNS infection was the second most frequent diagnostic category (accounting for 10 (18.5%) of cases)

while 6(11.1%) cases were spinal pathologies. Four patients were allocated to the 'other' category; they all had chronic subdural haematoma and were referred for neurosurgery. The two patients assigned to 'uncertain' had background HIV infection with hemiparesis as well as impaired sensorium. However, one died before any further investigation could reveal the definitive diagnosis while the other could not afford neuroimaging. The diagnostic categories are shown in table 2, while table 3 shows the benefits of the consultation process relative to the number of patients.

DISCUSSION

The need for more accurate diagnosis and evidenced-based therapeutic measures for neurological disorders have increased the demand for neurological services. While the burden of neurological diseases is increasing globally, shortage and skewed distribution of neurologists persist in Nigeria as in most African countries [10]. The median neurologist; population ratio in Europe is 4.84/100,000 compared to the paltry 0.03/100,000 in Africa [10]. A significant pressure is therefore on the neurologist for effective and adequate neurological service delivery.

This study revealed a higher frequency of neurological admission (36.7%) compared to previous studies in Nigeria [6-9]. While this may be due to the relatively short duration of the study, it may also be due to possible clustering of stroke cases during the study period (the

Table 2. Frequency table showing the neurological diagnostic categories.

Neurological diagnostic categories	Number of patients (%)
Cerebrovascular	26(48.1)
Epilepsy	1(1.8)
Spinal pathology	6(11.1)
Movement disorders	2(3.7)
Cerebral malignancy	1(1.8)
Infections	10(18.5)
Neuropathies	2(3.7)
Others	4(7.4)
Uncertain	2(3.7)
Total	54(100%)

Table 3. Frequency Table showing the Influence of the neurological consultations.

Outcome of neurological consultations	Number of patients (%)
New neurological diagnosis	4(7.4)
Incorrect diagnosis changed	19(35.2)
Contribution to management plan	12(22.2)
No definite contribution	19(35.2)
Total	54(100%)

peak of dry season). Although evidence of seasonal variation in the incidence of stroke is inconsistent, many studies have documented higher incidence especially of ischaemic stroke types in warmer seasons [14,15]. On the other hand, this proportion could be a reflection of the referral pattern in the community. The mean or median age of 50 years of the patients in this survey is typical of medical admissions in our institution, as we have earlier documented [6]. Consistent with previous studies, cerebrovascular disease continues to be the most common cause of neurological admission, hence, the high referral rate. Even though there was no dedicated stroke unit in the hospital, the high referral rate due to stroke could be a reflection of the confidence level by other physicians in the expertise of the neurologist in stroke management.

Alternatively, it could be an indication of a more defensive medical attitude, with referrals driven by concerns over the need to reduce intra-unit mortality rate. We observed that there was no difference in the time

taken before a consultation was requested between patients in medical and non-medical wards suggesting that both medical and non-medical specialties readily requested neurological consultations. The chief reason for consultation was a complete takeover of patients' management while co-management and a second opinion were rarely requested. This is a sharp contrast to the findings by Ali et al. [16] in which only 13% of the referrals requested for patients to be taken over by the neurology team. This could reflect a more inclusive attitude towards neurological colleagues, even though consultant numbers have not increased in this institution. On the other hand, it could indicate a low affinity to manage neurological cases by general physician.

Neurological consultation was beneficial in about two-third of the patients in this study. Even in instances where correct neurological diagnosis had been made by the referring physician, the contribution to management plan was appreciable in close to a quarter of the cases. This argues against the traditional perception by generalist that neurologist are mainly diagnostician [12]. This findings is similar to that of Steiger et al [12] and Douglas et al [17] even though these studies were conducted among different populations. Consultations were found not to have any definitive contribution in about one-third of our patients (largely severe stroke cases and tetanus).

The reason for this finding is not readily apparent but we would like to posit that the finding may reflect the proficiency of the referring physicians in the management of tropical neurological conditions like tetanus rather than a lack of additional contribution from the consultation process. It is also possible that the referrals involving patients with severe stroke were undertaken to reduce mortality in the referring units. We believe the former explanation is more likely because a protocol for tetanus management used by Osalusi et al [18] is a common knowledge among the residents in addition to the fact that the training of physicians in Nigeria, irrespective of subspecialties inculcates the ability to aptly manage common tropical diseases including tetanus.

This study is not without its limitations; the relatively small sample size, short duration of the study and the fact that this was just an institutional single unit survey limits the degree to which these findings could be said to be reflective of neurological consultations in Nigeria. A long time prospective study will be able to fill this gap.

However, the strength of our study lies in the fact that while most of the Nigeria studies have highlighted the pattern of neurological admissions, we have evaluated the benefits of neurological consultations using contribution to patient's management, adequate investigations and accurate diagnosis as outcome

measures. We have also augmented the benefits of neurological consultation and made a case for increased utilization of this service.

In conclusion, we found that in-patient neurological consultations for the most part, led to improved patients diagnostic and management process. With a low consult rate of about 4-5 per week, there is still more room to access neurological opinion in this facility although, indiscriminate takeover of patients may unnecessarily increase the workload of the neurologist and prevent the opportunity for more neurological education for the referring physicians. A continuous training of the general physician is recommended as neurological disorders will continue to be seen by non-neurologist. Furthermore, guidelines on when patients should be referred should focus specialists' time on the patients that are most likely to benefit from their care.

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