

**Preliminary report on the Neurology workload in a central hospital in Sudan.**

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**Abstract:**

**Introduction:** Identification of the local pattern of neurological diseases is expected to help setting the priorities for good planning of management and public education.

**Objectives:** To identify the pattern of neurological disorders in a second biggest central hospital in Sudan.

**Methodology:** Review of the diagnosis of 170 patients, seen in the out patients neuro-clinic and the neurology ward from March 2010 to February 2011, was done. Patients who were in follow up by other neuro-clinics were excluded.

**Results:** The male to female ratio was 1:1 Patients who were 20-60 years old comprised 54%. About 50% of patients live in Omdurman city. Motor symptoms were the most common presenting symptoms forming 64.1% followed by cranial nerves symptoms 27.6%. Stroke was the commonest encountered diagnosis seen in 20.7%, followed by epilepsy in 16.6%, headache in 9.6%, movement disorders in 7.7%, peripheral neuropathy in 3.6%, demyelination in 1.8%, cerebral venous sinus thrombosis (CVST) 1.8% and tumours in 1.2% patients. Stroke was more common in patients from East Sudan and Epilepsy was more common in patients from West Sudan. Vascular and degenerative changes were the commonest abnormalities seen in imaging studies. Demyelination and neoplasms were more common in females.

**Conclusion:** Stroke, epilepsy and headache were the commonest neurological disorders met in Omdurman Teaching Hospital.

**Key words:** general hospital, neurology department, neurological disorders.

**O**mdurman Teaching Hospital (OTH), at the west bank of the river Nile, was founded in 1898. It has 400 beds capacity and serves about 2.8 million inhabitants, with admissions estimated not less than 600 patients a month supervised by 16 consultant physicians. OTH serves as training centre for the medical students and post grades. The overall cases pool in a district general hospital and general medical practice is estimated to contain around 12-20% neurological cases<sup>1,2</sup>. Review of such group of patients helps improving patient's welfare. This is particularly important when the resources are limited for patients who need specialized service and sometimes

urgent management<sup>3,4</sup>. It is essential for patients with neurological diseases to have reasonable explanation for their symptoms<sup>5</sup> by a neurologist, to alleviate their doubts and concerns<sup>6</sup>. To our best of knowledge this is the first report on neurological cases treated in OTH.

**Objectives:**

To find out, and document the pattern of neurological diseases, seen in OTH.

**Methodology:**

This is a descriptive study. Prospective collection of data started from March 2010 up to February 2011. A questionnaire was designed for patients attending the neurology outpatient clinics and the inward patients. The questionnaire was tested in small sample for validation of the questions before implementation. Serial numbers were used instead of patients' names. The questionnaire contained demographic data, history, and

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physical examination according to the findings of the consultant neurologist in charge. Relevant investigations and the final diagnosis were also added.

**Exclusion criteria:** Questionnaires with unclear handwriting were excluded.

**Ethical clearance:** Because the Institutional review board was not yet formed, permission was taken from the hospital administration and chiefs of the two neurological units. Also, the objectives of the study were explained to each and every patient and his/her consent was, thereafter obtained. Questionnaires were filled by the investigators and the neuro-registrars.

**Statistical analysis:** Analysis was performed using SPSS version. Means and correlations were done using one sample *t*-test.

**Results:**

A total of 170 patients were included in this study. The male to female ratio was 1:1. Only one patient was under 10 year of age. Teenagers were 26 patients, those between 20-60 years of age were 92(54%), and patients older than 60 years were 40. More than fifth of the patients reside outside Khartoum estate.

The presentation mode showed that 109 (64.1%) presented with motor symptoms, 47 (27.6%) had cranial nerves symptoms, 39 (22.9%) had higher functions disturbance and 16 (9.4%) had sphincter problems.

About one third of the patients had no imaging investigation, but more than 40% had magnetic resonance imaging (MRI). Abnormalities in the imaging were as follows, vascular in 29 (17.1%), degenerative in 17 (10%), neoplastic in 7 (4.1%), infectious in 4 (2.4%) and demyelination in 3 (1.8%) patients. The pattern of neurological disorders is depicted in table 1.

Stroke was common in patients originally from East Sudan 64 (37.5%) and least descendents of South Sudan 2 (1.2%). The rest of patients with stroke comprised 19 (11.1%), 21 (12.3%), 20 (11.9%) from the northern, western and central Sudan respectively. Epilepsy was encountered in 65 (38.4%) patient descendents of west Sudan

and 59 (34.6%) patients from central Sudan followed by people 20 (11.5%) from North.

**Table 1:** The pattern of presentation

Neurological Disorder	
Stroke	35 (20.7%)
Epilepsy	28 (16.6%)
Headache	16 (9.6%)
Movement disorders	13 (7.7%)
Infectious conditions	10 (6.0%)
Cerebellar disorders	8 (4.8%)
Peripheral neuropathy	6 (3.6%)
Myasthenia Gravis	4 (2.4%)
Demyelination	3 (1.8%)
CVST	3 (1.8%)
Tumors	2 (1.2%)

**Discussion:**

There is a growing need for neurology service in general hospitals. The percentage of patients seen by the general practitioner for neurological symptom is estimated annually to be around 9.5% of the population in UK. Common problems encountered there are headache/migraine, dizziness, spinal pain, faints or fits and stroke<sup>7</sup>. The number of patients seen by the neurologist on weekly bases in UK is estimated to be 33-144 patients with mean of 79 patients. The neurologist's impression about the need of their service was excellent as 80% thinks that the consultation was justified use of their specialized experience<sup>9</sup>. Although, 170 patients participated in our study, about 25-40 of the influx of patients are usually seen by a single neurologist in OTH every week. However, many of our patients do not have medical insurance.

Healthcare education for patients and their care givers on diseases like stroke have a positive impact on improvement of the quality of life and outcomes of medical care<sup>9, 10</sup>. The bulk of patients seen in our hospital were in the age groups between 20-60 years (54%). This reflects that the service provided is needed by the most important and active members of the society. Nevertheless, there is a growing need worldwide to care for our patients who were older than 60 years. In the elderly<sup>11</sup> and this was resembled by 23.5% of elderly control of risk factors positively

reduces the risk of vascular brain damage<sup>12</sup> because they are, also, liable to develop problems related to long term recumbence<sup>13</sup>. Nonetheless, the male to female ratio in patients attending neurology service in OTH is a good sign of health awareness and health seeking behavior<sup>14</sup>.

One of the major health problems in developing countries is the coverage area for general hospitals. Patients may find it difficult to access specialized service. In this study, 21.8% of patients were coming from outside Khartoum state. Therefore, there is genuine need for satellite neurology service or units outside Khartoum to link the neurological centre with the treating peripheral hospitals<sup>15,16</sup>.

About 29.5% of our patients have non-neurological symptoms due to a neurological disease. Hence, there is a need for

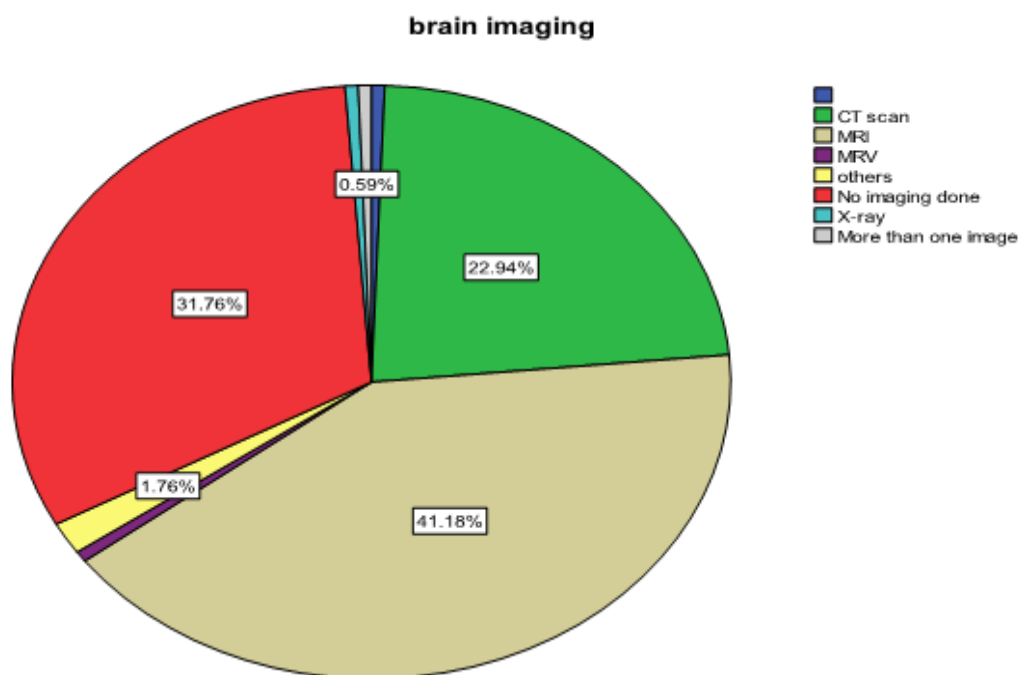
collaborative medical care and even the pharmaceutical care and advice<sup>17</sup>. This is particularly true because 34% of our patients had associated medical illnesses and they are in dual follow-up with other physicians. Important group to address in this point are epileptic patients with temporal lobe epilepsy who may have multiple gastroenterology investigations for their aura. Another important group is patients with cardiac abnormalities presenting with syncope and demonstrating abnormal brain images in which a cardiac cause must be ruled out. A small percentage of patients were having more than one system complaints as in diabetes mellitus and SLE. So, skill to tailor examination of a particular patient is valuable in a busy clinic with restricted resources and in the neurological consultations in a general hospital<sup>18</sup>.

**Table 2:** The geographical origin of patients with stroke

North 11.1%	East 37.5%	W 12.3%	Central 11.9	South 1.2%
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**Table 3:** The geographical origin of patients with epilepsy

North 11.5%	East 0.00%	W 38.4%	Central 34.6 %	South 0.00%
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**Figure 1:** The radiological findings of the study population

In regard to the radiology service, OTH does not have a scanner. In this study 69.3% had

abnormal imaging studies. Patients get their scans either through their medical insurance

or on private responsibility. Hence, the availability of scanners is of paramount importance to be accessible<sup>19</sup> and affordable. MRI has made extensive revolution in diagnosis and management of even rare neurological disorders<sup>20</sup>. The majority of patients needed to have MRI to raise the diagnostic accuracy<sup>21</sup>. The findings on the scan were vascular in the majority 34.1% and this may reflect the high worldwide prevalence of vascular brain disease<sup>22</sup>. The degenerative brain disease 20.7% on image and 9.7% had neoplasms that were either secondary or primary<sup>23</sup>.

The presence of patient with demyelinating diseases presses on the availability of both specialized neurology service and liaison with other disciplines to handle patient's care.

In this study, females were more affected, by demyelinating diseases and secondary neoplasms, than male. This finding is in keeping with the expectations<sup>24,25</sup>. There is an increased risk of secondary neoplasms in females from breast, ovary and uterus. In contrast there is no obvious reason why the vascular events were found in females more than males despite some literature reports this in association with atrial fibrillation<sup>26</sup>.

Our results showed that vascular events like stroke was more in patients originally from east Sudan while epilepsy was more in patients from west Sudan. However, concerning stroke, it may be due to prevalence of other systemic diseases in the Eastern community like hypertension and diabetes mellitus. Furthermore, there is no clear cause for the epilepsy being more common from patients originally from the west Sudan.

This also, needs further studies to evaluate the prevalence of these diseases in the different geographical areas.

### Conclusion:

The pattern of neurological disorders we have seen in 11 months period is well illustrated in this article. Many patients seen for neurological disorders were not medically insured and some live in far distances from our hospital. Setting our national health

priorities and structuring programs need the accuracy of diagnosis to know the exact incidence and prevalence of such medical problems.

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