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Original Research Article

Profile of paediatric neurologic emergencies at the children emergency ward in a tertiary hospital in Port Harcourt, Nigeria

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ABSTRACT

Background: Neurologic emergencies are life-threatening in most cases with risks for acute or lifelong complications. Though a common presentation in the paediatric group, there is paucity of studies in our environment. The aim of this study is to describe the pattern, prevalence and outcome of paediatric neurologic emergencies in the university of Port Harcourt Teaching Hospital.
Methods: A retrospective cross-sectional study conducted at the University of Port Harcourt Teaching Hospital. Data was obtained from the registers in the children emergency ward over a one-year period.
Results: A total of 1125 children were admitted into the CHEW in 2022, 67 (6.0%) of them had neurologic emergencies. Their ages ranged from 3 months to 16 years with a mean age was 7.6±5.2 years. Thirty-seven (55.2%) were males with a male to female ratio of 1.2:1. The most frequent diagnosis were meningitis and meningoencephalitis in 21 (31.3%), epilepsy among 9 (13.4%) while febrile convulsion and cerebral malaria accounted for 4 (6.0%) respectively. The main neurologic emergencies at presentations were raised intracranial pressure 34.3%, convulsions (31.3%), unconsciousness (16.4%) and paralysis (9.0%). Majority (70.2%) of them were discharged, 9 (13.4%) died, 8 (11.9%) DAMA while 3 (4.5%) were referred. More than half of those that died presented late to the hospital.
Conclusions: Neurologic emergencies are prevalent and are common causes of morbidity and mortality in children with meningitis being the commonest cause. There is need to enhance preventive strategies against meningitis.

Keywords: Paediatric emergencies, Prevalence, Pattern, Outcome

INTRODUCTION

Neurologic emergencies are life-threatening conditions which if not managed timely could lead to neurologic sequelae or death[1-3] Paediatric neurological emergencies account for 10-15% of clinical presentations seen in children's emergency rooms in southern Nigeria and have remained a leading cause of morbidity and mortality among children in the region.[1-3]

The common paediatric neurological emergencies seen in Nigeria are predominantly related to preventable causes particularly infectious diseases including meningitis, encephalitis, cerebral malaria and febrile convulsions, however, non-infectious aetiologies like intracranial tumors, cerebrovascular accidents in sickle cell anaemia, traumas and epilepsy are now becoming predominant.[1,4-7]

Numerous neurologic illnesses that affect children are critical with very rapid progression which can result in death.[6]The outcome of these neurological emergencies is influenced by a myriad of factors including prompt recognition of symptoms, the timeliness of clinical presentation by care givers, availability of essential drugs, supplies, neuro-diagnostic modalities as well as limitations from harmful ethno-religious practices and socioeconomic factors which hamper funding and limit access to optimum health care.[2,4,7,8] Hence, early presentation to the hospital,

prompt diagnosis and treatment could avert neurologic impairment and improve the outcome.[6] Planning efficient preventive modalities in resource limited countries requires an awareness of the prevalence, pattern and effects of these diseases.[6] Evidence suggests that neurologic conditions frequently contribute to morbidity and mortality. The frequency, clinical features and prognosis of these disorders in children have not been extensively studied in Port Harcourt. This study aims to describe the pattern, prevalence and outcome of paediatrics neurologic emergencies in the University of Port Harcourt Teaching Hospital.

METHODS

Study setting

The study was conducted in the Children's Emergency Ward (CHEW) of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers Sate, Nigeria between January 2022 to December 2022. The CHEW has facilities for both admission and observation. It is a 15 bedded ward consisting of 10 beds in the open ward, 4 beds in the intensive care unit and 2 beds in the isolation room. Children who present with medical emergencies are first managed in CHEW. The ward is manned by a team of doctors consisting of 2 consultants, 4 resident doctors as well as nurses. The CHEW is often used as a first line service point by the inhabitants of the host community as well as the neighboring communities. Also, it serves as a tertiary referral center for neighboring states and hospitals within and outside the state.

Study design and patients

This study is a descriptive cross sectional retrospective study, patients that presented in the CHEW in 2022 were studied. A purposive sampling technique was employed. The data from the emergency register was retrieved, all those admitted with neurologic emergencies were noted and their medical records were retrieved from the records department.

All the children who presented with neurologic emergencies who were aged between one month and below 18 years were included in the study. Demographic data, primary diagnosis, neurologic emergencies they presented with, time between onset of symptoms and seeking care in the hospital, duration of hospital admission and outcome were entered into a proforma.

For all patients who presented to the CHEW, a detailed history was obtained and they were thoroughly examined including a detailed neurologic examination. Necessary laboratory investigations were carried out including lumbar puncture for CSF analysis as indicated with concomitant random blood glucose, blood culture, neuroimaging, full blood count and others before a definitive diagnosis was made.

The time between the onset of symptoms and hospital presentation was classified into three groups viz; early (0-2 days), intermediate (3-5 days), and late presentations (> 5 days). This classification was adapted from two previous studies conducted in Nigeria.[9,10]

Data analysis

Data was analyzed using IBM statistical product and service solution (SPSS) version 25. Descriptive statistics were presented as tables in frequency distribution and percentages. Chi square test and t test were conducted to compare different subgroups with a p value set at ≤0.05.

RESULTS

A total of 1125 children aged 2 months to 16 years were admitted into the children emergency ward in 2022. Sixty-seven (6.0%) of them presented with neurologic emergencies (Figure 1).

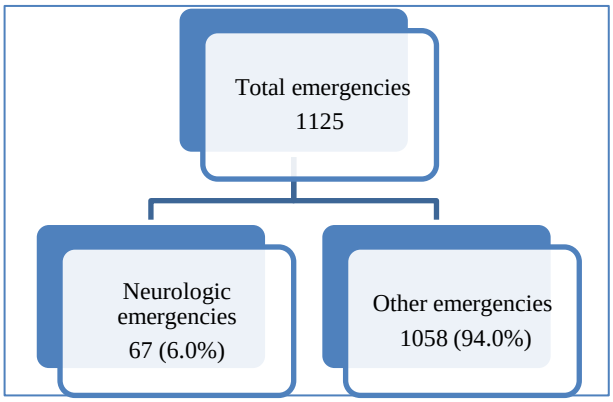

Figure 1: Prevalence of neurologic emergencies.

Table 1: Distribution of patients with neurologic emergencies by age and sex.

Variables	N	%
Age (years)		
< 1	11	16.4
1-5	15	22.4
>5-10	13	19.4
>10-15	24	35.8
>15	4	6.0
Sex		
Males	37	55.0
Females	30	45.0
Time of presentation		
Early ≤ 2 days	35	52.2
Intermediate 2-5 days	21	31.4
Late >5 days	11	16.4
Total	67	100.0

Of the 67 patients who presented with neurologic emergencies, 37 (55.2%) were males, with a male to female ratio of 1.2:1. Their ages ranged from 3months to

16 years with a mean age of 7.6±5.2 years; twenty six of them (38.8%) were under 5 years, while 41 (61.2%) were above 5years of age. Thirty-five (52.2%) of the patients presented to the hospital within the first two days of illness (Table 1). The primary diagnosis among patients who presented with neurologic emergencies included meningitis among 19 (28.3%), epilepsy 9 (13.4%), febrile convulsion 4 (6.0%), severe (cerebral) malaria (6.0%), sickle anaemia with CVD 4 (6.0) (Table 2).

Table 2: Frequency of primary diagnosis.

Primary diagnosis	N	%
Meningitis	19	28.3
Epilepsy	9	13.4
Febrile convulsion	4	6.0
Severe malaria	4	6.0
Sickle cell anaemia with CVD	4	6.0
Traumatic brain injury	3	4.5
Brain tumour	3	4.5
Hypoxic encephalopathy	2	3.0
Poison	2	3.0
Psychosomatic disorder	2	3.0
Cerebral abscess	2	3.0
Meningoencephalitis	2	3.0
Metabolic derangement	2	3.0
Leukaemia	2	3.0
Generalized tetanus	2	3.0
Guillain Barre syndrome	2	3.0
Carvenous sinus thrombosis	1	1.5
Panopthalmitis	1	1.5
Cyanotic congenital heart disease	1	1.5
Total	67	100.0

Table 3: Frequency of neurological emergencies-symptoms/signs at presentation.

Symptoms /signs at presentation	N	%
Signs of raised ICP	23	34.3
Convulsions/status epilepticus	21	31.3
Coma	11	16.4
Paralysis	6	9.0
loss of vision	2	3.0
Spasm	2	3.0
Loss of sensation	1	1.5
Abnormal behavior	1	1.5
Total	67	100.0

The common neurologic emergencies patients presented with are shown in (Table 3). Twenty three (34.3%) presented with raised intracranial pressure (ICP), 21 (31.3%) had convulsion/status epilepticus, loss of consciousness in 11 (16.4%) and paralysis 6 (9.0%). About half of them (56.7%) were admitted for <7 days while 10(14.9%) were admitted >14 days. Seventy percent of the patients were discharged, while 9 (13.4%) died and 3 (4.5%) were referred after stabilization. Six (66.7%) of the 9 patients that died, died within 48 hours of presentation. The cause of death includes Meningitis (44.4%), cerebral malaria (22.2%), intracranial tumour (22.2%) and acute myelogenous leukemia (AML) with CNS involvement (11.1%) (Figure 2).

Table 4: Duration of admission, outcome of children with neurologic emergencies.

Variable	Frequency (N=67)	%
Duration of admission (days)		
<7	38	56.7
7-14	19	28.4
>14	10	14.9
Out come		
Discharged	47	70.2
DAMA	8	11.9
Died	9	13.4
Referred	3	4.5
Total	67	100.0

DAMA: Discharge against medical advice.

Table 5: Relationship between the timing of presentation and the outcome.

Time between onset of symptom and hospital presentation	Outcome N (%)		Total N (%)
	Died	**Did not die**	
Early ≤2 days	1 (2.9)	34 (97.1)	35 (100)
Intermediate 3-5 days	2 (9.5)	19 (90.5)	21 (100)
Late >5 days	6 (54.5)	5 (45.5)	11 (100)
Total	9 (13.4)	58 (86.6)	67(100)
$\chi^2$19.63, DF 2, p 0.00005			

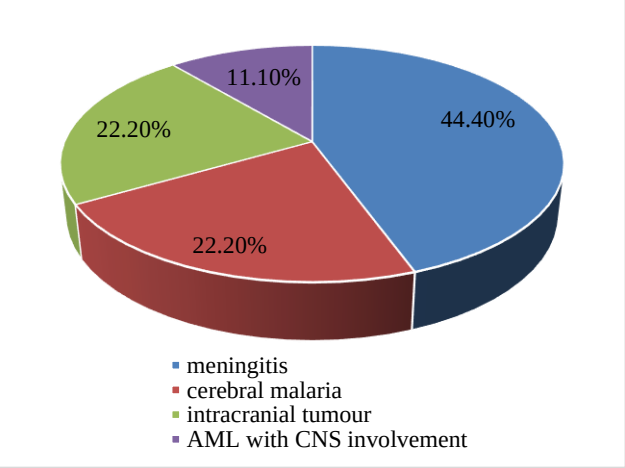

Figure 2: Cause of death.

The relationship between the time of presentation and the outcome is shown in (Table 5). The proportion of patients that died increased as the time between onset of symptom and hospital presentation increased. About 3.0% of those

that presented early died compared to the 6 (54.5%) of those that presented late. This difference was statistically significant p<0.001.

DISCUSSION

This study showed that prevalence of neurologic emergencies among children in UPTH is 6.0%, this finding is lower than reports from two previous studies conducted in Southern Nigeria. This may be due to the span of these previous studies as both studies were carried out over a longer period of time.[1,2] It could also be as a result of expansion of paediatric service care points within the state as other tertiary hospitals as well as several private paediatric hospitals now accept and handle similar cases.

More males were admitted for neurologic emergencies, this is not surprising as it reflects the sex discrepancy in accessing tertiary health care and the vulnerability of the girl child described by some authors.[2,11] Treleaven et al[11]examined gender differences in paediatric diseases, referral patterns, and outcomes using data from a paediatric hospital emergency department. They reported that the referral facility received almost twice as many boys as it did girls. Even after adjusting for sickness severity and socio-demographic traits, males were shown to have a considerably higher likelihood of skipping over lower-level institutions and seeking care at the tertiary facility. This shows that parents give boys preferential attention, which may cause a high level of morbidity among ill female children and may also be the case in this present study.

This study showed that children older than 5 years had more neurologic emergencies, this finding is at variance with other studies, where neurologic emergencies were more prevalent among children younger than five years of age.[1,2,5] This could be due to the low prevalence of malaria in this study, a condition which has been reported as a major cause of morbidity, including febrile convulsions among the under-fives in Nigeria.[1,2,5] Report has shown a decline in the prevalence of malaria over the years, for instance, Oyibo et al had reported that over the past ten years, malaria infection prevalence in children under the age of five has significantly decreased in all of Nigeria's major geopolitical zones and in the majority of its individual states, despite the fact that Nigeria has by far the highest burden of the disease in the world.[12]

Meningitis was the most common diagnosis in this study. This finding is not surprising because infections are still common and fatal in our environment, however this is at variance with other studies where malaria was the commonest diagnosis, this difference may be as a result of the higher proportion of children older than 5 years in this study.[2,5] Additionally, it's conceivable that the prevalence and severity of malaria among older children may have decreased as a result of acquired partial immunity. The neurologic symptoms presented in this study are similar to finding by Ngoue et al however in their study convulsion and coma predominated unlike in this present study were raised ICP was more common.[5]

Though majority of the patients were discharged home, mortality of 13.4% was recorded, this is higher than a report in Uyo Nigeria, where a mortality of 6.1% was recorded.[2] The higher rate of death recorded in this present study could be attributed to the late presentation as more than half of those that died presented late (more than five days from onset of symptoms). This is similar to a study carried out in Benin.[1] Similarly, two Nigerian studies had related the interval between the onset of symptoms and time of presentations to the outcome of the illness and asserted delay in presentation as a contributor to childhood morbidity and mortality. [9,10] Reasons for late presentations could be due to use of self-prescribed antibiotics, patronizing unqualified persons for treatment, traditional and religious practices that patients are subjected to before presenting to the hospital and ignorance as reported in previous study, however, the reasons for late presentation were not explored in this present study.[9,10] It could also be that the higher death rates in this study could be as a result of out-of-pocket payment for health care, for instance buying antibiotics is quite expensive and not often sustainable as meningitis was the most common cause of death in this present study.

CONCLUSION

Neurologic emergencies are common in our environment and contribute to significant morbidity and mortality in children, most of these conditions are largely preventable. Modalities to prevent meningitis, associated paediatric neurological emergencies and ensure effective treatment is important to reduce the morbidity and child mortalities in Port Harcourt.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Ofovwe GE, Ibadin MO, Ofoegbu B. Pattern of emergency neurologic morbidities in children. J Natl Med Assoc. 2005;97(4):488-92
2. Akpan MU, Eno-ObongUtuk FE, Udeme Akpan M. Pattern of paediatric neurological emergencies in university of uyo teaching hospital, uyo, akwa-ibom state of nigeria. Ibom Med J. 2014;7(1):23-9.
3. Iloeje SO. Paediatric neurologic emergencies at the University of Nigeria Teaching Hospital, Enugu. West Afr J Med. 1997;16(2):80
4. Jackson M, Szczepaniak M, Wall J. Numbers and types of neurological emergencies in England and the influence of socioeconomic deprivation: a retrospective analysis of hospital episode statistics data. BMJ. 2022;12:e061843.

5. Ngoue JE, Um SSN, Nengom JT. Incidence and pattern of neurologic emergencies in children at the mother and child center of the chantalbiya foundation. Pediatric Oncal. 2022;19(4):47-53.
6. Tshimangani T, Pongo J, BodiMabiala J, Yotebieng M, O'Brien NF. Pediatric acute severe neurologic illness and injury in an urban and a rural hospital in the democratic republic of the Congo. Am J Trop Med Hyg. 2018;98(5):1534-40.
7. Uche EO, Shokunbi MT, Malomo AO, Akang EE, Lagunju I, Amanor-Boadu SD. Pediatric brain tumors in Nigeria: clinical profile, management strategies, and outcome. Childs Nerv Syst. 2013;29(7):1131-5.
8. George IO, Frank-Briggs AI. Stroke in Nigerian Children with Sickle Cell Anaemia. J Public Health Epidemiol 2011;3:407-9.
9. Ibraheem RM, Abdulkadir MB, Gobir AA. Johnson WBR. Socio-demographic and clinical factors predicting time to presentation for children with pneumonia in Ilorin, Nigeria. Alexandria J Med. 2017; 54:247-50.
10. Gabriel-Job N, Azubogu SU. Prevalence and pattern of pneumonia among children admitted into university of port harcourt teaching hospital: a two year review. International J Trop Dis Health. 2020;3:1-6.
11. Treleaven E, Toan PN, Le DN, Diamond-Smith N, Partridge JC, Le HT. Gender disparities in child health care seeking in northern Vietnam. Asian Population Stud J. 2016;12:312-30.
12. Oyibo W, Ntadom G, Uhomoibhi P, Oresanya O, Ogbulafor N, Ajumobi O, et al. Geographical and temporal variation in reduction of malaria infection among children under 5 years of age throughout Nigeria. BMJ Global Health 2021;6:e004250.

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