



An Analysis of Disorders seen at the Paediatric Neurology Clinic, University College Hospital, Ibadan, Nigeria

Une analyse des désordres observés à la clinique de neurologie pédiatrique, University College Hospital, Ibadan, Nigeria

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ABSTRACT

BACKGROUND: Paediatric neurological disorders constitute a major cause of disability in childhood. Children in the developing countries are disproportionately affected and in addition face the added burden of poverty, inadequate health facilities, stigmatisation and lack of facilities for rehabilitative care.

OBJECTIVE: To describe the spectrum of neurological disorders seen among Nigerian children presenting at the paediatric neurology clinic of the University College Hospital, Ibadan, Nigeria.

METHODS: All children presenting at the paediatric neurology clinic of the University College Hospital, Ibadan, Nigeria over a period of 20 months were prospectively studied. Diagnoses were made from detailed history, thorough physical examination, with particular emphasis on the central nervous system and appropriate investigations as indicated.

RESULTS: There were a total of 644 cases during the study period, 369 males and 275 females, giving a male to female ratio of 1.3:1. There were 1353 consultations at the paediatric neurology clinic and these accounted for 21.0% of the total 6,442 consultations at the paediatric specialist clinics in the hospital. The most frequent paediatric neurological disorders were epilepsy (45.3%), cerebral palsy (36.0%), neuro-muscular disorders (4.5%) and mental retardation (4.5%).

CONCLUSION: Paediatric neurological disorders constitute a major reason for paediatric specialist care in Ibadan, Nigeria. Preventable causes play a major role in the aetiology of the major paediatric neurological disorders seen in this part of the world. *WAJM* 2009; 28(1): 328–332.

Key words: Paediatric, neurological, disorders, Ibadan, Nigeria.

RÉSUMÉ

CONTEXTE: pédiatrie maladies neurologiques constituent une cause majeure de handicap dans l'enfance. Les enfants dans les pays en développement sont touchés de façon disproportionnée et, en outre, faire face au fardeau supplémentaire de la pauvreté, l'insuffisance des services de santé, la stigmatisation et le manque d'installations de soins de réadaptation.

OBJECTIF: Pour décrire le spectre des troubles neurologiques chez les enfants nigériens lors de la présentation clinique de neurologie pédiatrique de l'University College Hospital, Ibadan, Nigeria.

MÉTHODES: Tous les enfants présentant à la clinique de neurologie pédiatrique de l'University College Hospital, Ibadan, Nigeria, sur une période de 20 mois ont été étudiées prospectivement. Les diagnostics ont été faits à partir de détail de l'histoire, examen physique complet, avec un accent particulier sur le système nerveux central et des investigations appropriées, comme indiqué.

RESULTATS: Il y avait un total de 644 cas au cours de la période d'étude, 369 hommes et 275 femmes, soit un ratio hommes / femmes de 1.3:1. Il ya eu 1353 consultations à la clinique de neurologie pédiatrique et ces représentaient 21,0% du total de 6442 consultations à la pédiatrie des cliniques spécialisées dans l'hôpital. Les plus fréquentes sont les troubles neurologiques pédiatriques épilepsie (45,3%), la paralysie cérébrale (36,0%), troubles neuro-musculaires (4,5%) et mentale (4,5%).

CONCLUSION: pédiatrie maladies neurologiques constituent une raison majeure pour des soins spécialisés en pédiatrie Ibadan, Nigeria. Prévention des causes jouent un rôle majeur dans l'étiologie des principaux troubles neurologiques en pédiatrie dans cette partie du monde. *WAJM* 2009; 28(1): 326–330.

Mots clés: pédiatrique, neurologiques, de troubles, Ibadan, Nigeria.

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Abbreviations: AEDs, Anti-Epileptic Drugs; CP, Cerebral Palsy; CNS, Central Nervous System.

INTRODUCTION

Neurological disorders are a major cause of disability in childhood and children in the developing world are disproportionately affected.^{1,2} Affected children tend to suffer prolonged morbidity with consequent impairment of the overall quality of life, often persisting till adulthood. Children with neurological disorders in the developing world also face the added burden of poverty, inadequate health facilities, inadequate community services, parental ignorance and illiteracy, as well as lack of facilities for rehabilitative care.^{3,4} Children with neurological disorders require a level of specialised care which is non-accessible to most children in the developing world. They require prolonged care which often costs money, time and impose considerable burden on the family, society and the government.⁵ Poor obstetric care, poverty, infections, ignorance, inadequate immunisation, malnutrition and poor living conditions have been reported as major factors in the aetiology of paediatric neurological disorders in the developing world.⁶⁻⁹ Genetic factors, chromosomal abnormalities, metabolic disorders are however also known to play a significant role with respect to the aetiology of paediatric neurological disorders.¹⁰

Osuntokun¹¹ in the early seventies, reported intracranial infections, tetanus, poliomyelitis, epilepsy, polyneuropathies and Pott's disease as the major neurological diseases seen at the University College Hospital, Ibadan. The study however comprised adults and children and the actual burden of paediatric neurological disorders is not readily appreciated from this study. Studies from other parts of the country¹²⁻¹⁴ reveal epilepsy, cerebral palsy, mental retardation and speech disorders as the major paediatric neurological disorders in Nigeria. Burton and Allen¹⁵, reported seizures and developmental delay as the two leading paediatric neurological problems seen in Gambian children.

In view of the lack of recent data on this subject, this study was undertaken to review the spectrum of neurological disorders seen among children presenting at the paediatric neurology clinic of the University College Hospital,

Ibadan, Nigeria.

MATERIALS AND METHODS

The study was prospective and was carried out over a period of 20 months, May 2004 to December 2005. All children who presented at the paediatric neurology clinic of the University College Hospital, Ibadan, Nigeria during the study period were carefully evaluated by the paediatric neurologist for evidence of diseases referable to the central nervous system. All cases attending the paediatric neurology clinic for the first time in the course of the study were regarded as new cases while those who had been registered in the neurology clinic and had made at least one previous visit to the clinic were regarded as old cases. All new cases presenting at the paediatric neurology clinic of the hospital are as a routine, all evaluated by the paediatric neurologist on their first visit. Other children who were old patients of the unit were all re-evaluated by the paediatric neurologist in order to ascertain the diagnoses. Clinical evaluation involved a detailed history of the illness, pregnancy, birth, development and past medical history obtained from the care-giver. A thorough physical examination was carried out on each patient with particular emphasis on the central nervous system. The weight, height, occipitofrontal circumference were taken and recorded in each patient; the functions of the higher centres were assessed to evaluate consciousness, orientation, speech and language, all the cranial nerves were evaluated, the motor and sensory systems were examined. The child's behaviour was carefully studied during evaluation in order to detect any abnormalities. All the physical findings were documented in all cases. Relevant investigations such as electroencephalogram (EEG), X-rays, cranial computerised tomography scans, and biochemical studies were carried out as indicated. All children with epilepsy had electroencephalography. Cranial computerised tomography scans were done in all cases of suspected space occupying lesions, cerebrovascular accident, congenital brain anomalies and neurocutaneous syndrome. This investigation could not be done in all the cases recruited into this study because

of its exorbitant cost, it was therefore done in cases in which it was mandatory for diagnosis and in some other cases whose care-givers could afford it. Serum creatine kinase assay was done in all children with suspected muscular dystrophy. Muscle biopsies were not done because there are no facilities for this investigation in this centre. Diagnosis of myasthenia gravis was confirmed by Tensilon test. Children whose clinical conditions necessitated multidisciplinary evaluation were referred to the appropriate specialists in order to establish a definitive diagnosis and institute appropriate management. These included Ophthalmologists, Audiologists, Physiotherapists and Clinical Psychologists.

All children who were diagnosed as having diseases of the central nervous system were recruited into the study. Their case notes were coded in order to ensure that duplication of cases did not occur in the study. Other information obtained on each patient included: name, gender, age at first presentation to the clinic, initial diagnosis and definitive diagnosis. Data was entered into a microcomputer and analysis done using the SPSS 11 for windows software.

RESULTS

There were a total of 1,353 consultations at the paediatric neurology clinic of the UCH, Ibadan during the period of the study. This represents 21.0% of the total consultations at the children's outpatient specialist clinics during the period. A total of 644 cases were seen during the period, 306% were new cases while 338% were old patients of the paediatric neurology unit. The number of consultations exceeded the total number of patients as one third of the new patients and about two-thirds of the old patients recruited into the study made more than one visit to the clinic during the period under review.

New Patients

Of the 306 new cases, there were 171% males and 135% females, giving a male to female ratio of 1.3:1. Their ages ranged from 1 month to 14 years, median 42 months. One hundred and ninety eight (64.7%) were below the age of five years, 83 (27.1%) were between the ages of five

and ten years while 25 (8.2%) were above the age of 10 years. The major reasons for referral to the paediatric neurology clinic during the study period were developmental delay and recurrent afebrile seizures. The most frequent primary diagnoses in the children were cerebral palsy (44.1%), epilepsy (31.4%), neuromuscular disorders (6.9%) and mental retardation (4.9%). The major underlying causes of cerebral palsy (CP) were severe birth asphyxia (45.2%), severe neonatal jaundice (26.2%) and post infectious brain damage (10.7%).

Epilepsy, the separate occurrence of two or more unprovoked seizures, not diagnosed as neonatal or febrile seizures,¹⁶ was the primary diagnosis in 96 (31.4%) of the new cases seen. Forty-seven (34.8%) of the children with cerebral palsy and three (60%) of those with neurocutaneous syndrome had associated epilepsy. Epilepsy, either as a primary or an associated medical problem was present in a total of 146 (47.7%) of the new cases. Three (3.1%) of the ninety six children with epilepsy and 60 (44.4%) of the 135 children with cerebral palsy also had associated mental retardation. Mental retardation was present in a total of 78 (25.4%) of the new cases.

Twenty one (6.9%) children were referred to the clinic on account of neuromuscular disorders. Brachial plexus injury, Erb's palsy was the most frequent neuromuscular disorder and was seen in ten cases. There were three cases of residual polio paralysis, two cases of infantile spinal muscular atrophy, three cases of Duchenne muscular dystrophy, two cases of sciatic nerve injuries secondary to intramuscular injections and one case of Guillain Barre Syndrome.

Hearing impairment was the primary diagnosis in six (2.0%) of the patients. Three of these were post meningitis, two were due to chronic suppurative otitis media and 1 was due to congenital rubella syndrome. Hearing impairment was also present in 33 (24.4%) of the cases of CP. Visual impairment was the primary diagnosis in five (1.6%) of the cases, one was due to congenital CNS malformations while the remaining four were sequel to meningitis. Visual impairment was also one of the frequent deficits seen in the cases of CP and was seen in 34 (25.2%) of

them.

A diagnosis of neurocutaneous syndrome was made in five (1.6%) children, three cases of neurofibromatosis type 1 and 2 cases of Sturge Weber syndrome. Other less common conditions seen in the study were congenital CNS anomalies (3.0%), brain tumours (1.6%), behavioural disorders (1.0%) and cerebrovascular accidents (1.0%). The three cases of cerebrovascular accident were due to sickle cell anaemia.

Old Patients

Three hundred and thirty eight old patients of the unit were seen during the period of study, comprising 198% males and 140% females, giving a male to female ratio of 1.4:1. Their ages ranged from 1 month to 15 years, median 60.0 months. One hundred and seventy nine (53.0%) children were below the age of 5 years, 92 (27.2%) were between the ages of 5 and 10 years and 67 (19.8%) were above the age of 10 years. The spectrum of diseases seen among this group of patients was similar to that seen among the new cases. The most frequent neurological problems were seizures and developmental delay. The most frequent primary diagnoses were epilepsy (58.0%), cerebral palsy (28.7%), mental retardation (4.1%) and neuromuscular disorders (2.4%). A larger proportion of epilepsy cases were seen among the old cases as epilepsy was the primary diagnosis in more than half (58.0%) of them. Thirty (30.9%) of the 97 children with CP had associated epilepsy. Epilepsy was therefore present in 226 (66.9%) of the old cases.

Eleven (5.6%) of the 196 children with epilepsy and 47 (48.5%) of the 97 cases of CP had associated mental retardation. Mental retardation either as primary diagnosis or an associated problem was present in 72 (21.3%) of the old cases. There were 8 cases of neuromuscular disorders among the old cases, two cases each of myasthenia gravis and residual polio paralysis and one case each of Duchenne muscular dystrophy, Bell's palsy, Erb's palsy and sciatic nerve injury following intramuscular injection.

Hearing impairment was the primary diagnosis in three (0.9%) of the old cases and all were complications of meningitis.

Visual impairment was the primary diagnosis in two of the old cases and both cases were sequel to viral encephalitis. Four cases of neurocutaneous syndrome were seen among the old cases, three cases of neurofibromatosis type 1 and one case of Sturge Weber syndrome. Other less common conditions seen among the old cases were congenital CNS anomalies (2.1%), chorea (1.2%), attention deficit hyperactivity disorder (0.3%), cerebrovascular accidents (0.3%) and migraine (0.3%). Tables 1 and 2 show the age distribution and the pattern of neurological disorders in the entire study population respectively.

Table 1: Distribution of the 644 cases by Gender and Age Group

Characteristic	Number (%)
Gender	
Male	369(57.3)
Female	275(42.7)
Age Group	
< 1 year	84(13.0)
1–5 years	293(45.5)
>5–10 years	175(27.2)
>10 years	92(14.3)

Table 2: Pattern of Paediatric Neurological Disorders as seen in the Study

Primary Diagnosis	Number of Cases (%)
Epilepsy	292(45.3)
Cerebral palsy	232(36.0)
Neuromuscular disorders	29 (4.5)
Mental retardation	29 (4.5)
Congenital CNS anomaly	16 (2.5)
Neurocutaneous syndrome	9 (1.4)
Hearing impairment	9 (1.4)
Visual impairment	7 (1.1)
Others	21 (3.3)
Total	644(100.0)

DISCUSSION

Paediatric neurological disorders constitute a major reason for paediatric specialist care in Ibadan, Nigeria. The study shows that one out of every five children attending the paediatric specialist

clinic of the UCH, Ibadan suffers from a neurological disorder. This finding suggests that neurological disorders constitute a major cause of chronic morbidity in the paediatric age group in Ibadan, Nigeria. Unfortunately, neurological disorders have not been given the desired attention in the developing world.¹⁷ Children below the age of 5 years constituted more than two-thirds of the cases seen in this study. This group of children are known to be the most vulnerable to infections and their attendant high mortalities in the developing world.

The major paediatric neurological disorders identified in the study were epilepsy, cerebral palsy, mental retardation and neuromuscular disorders. This pattern is in some respect different from that obtained in the earliest studies carried out on children in this centre. Osuntokun¹¹ in 1971 reported tetanus, meningitis, epilepsy, cerebral palsy, and poliomyelitis as the major paediatric neurological disorders seen at the UCH, Ibadan, Nigeria. This study on the other hand shows a marked diminution in the prevalence of tetanus and poliomyelitis, two major vaccine-preventable diseases. This change can be attributed to the improved immunization practice and all the efforts currently geared towards the elimination of the major vaccine-preventable diseases particularly from the developing countries of the world.¹⁸

Epilepsy and cerebral palsy remain the leading paediatric neurologic disorders in Ibadan, Nigeria. The burden of these diseases was clearly established by Osuntokun¹¹ and three decades after, these diseases still remain major causes of chronic morbidity in the paediatric age group. This pattern is consistent with previous reports from other parts of the country.¹²⁻¹⁵ Epilepsy is the leading primary diagnosis in the study and was seen in 292(45.3%) of all cases. A significant proportion of children with cerebral palsy and neurocutaneous syndrome also had associated epilepsy, making this condition the most prevalent neurological disorder in childhood in this part of the country. More than 40 million people worldwide have been estimated to suffer from epilepsy, and about 80% of these individuals live in the developing

world.^{19,20} Epilepsy is known to be associated with stigmatisation, psychological and emotional trauma in this part of the world.²⁰ As a result of ignorance, illiteracy and misinformation regarding the actual nature of the condition, many children are removed from school and denied the education that would have made them financially independent in future.⁴ Other recognised problems associated with epilepsy management in the developing world include poor compliance with therapy, limited availability of anti-epileptic drugs (AEDs), poor quality control of locally produced AEDs and poverty which makes the drugs unaffordable to most families.²¹ These then lead to the vicious cycle of seizure recurrences and the social and physical burdens associated with the disease.²⁰

Cerebral Palsy is another prevalent paediatric neurological disorder seen in Ibadan, Nigeria. Most of the cases of CP in Nigeria are due to preventable causes.^{12,14, 22} CP imposes considerable economic, physical and psychological stress on the child and the affected family. Many of the affected children require specialised care and rehabilitative services which are out of the reach of the majority of such children in the developing world. The major underlying causes of CP in this study were severe birth asphyxia, severe neonatal jaundice and intracranial infections and this is consistent with previous findings in Nigeria.^{12,14,22}

Intracranial infections, predominantly meningitis was found to be a major cause of cerebral palsy, mental retardation, visual and hearing impairments in the study. Meningitis is a life threatening infection often associated with brain damage and severe neurological sequelae. The administration of routine childhood immunisations has markedly diminished the incidence of these infections in the developed world. These vaccines, namely Haemophilus influenzae Type B vaccine and conjugate pneumococcal vaccine are currently not part of the national immunisation programme in Nigeria due to the exorbitant cost. However, it has been argued that vaccination against Haemophilus influenzae Type B is cost effective in the

developing countries as well.²³

The improved recognition of other neurological conditions and the availability of newer diagnostic facilities, such as cranial computerised tomography scan, magnetic resonance imaging and biochemical tests facilitated the diagnosis of other conditions, not reported in earlier studies. Although preventable causes are responsible for the majority of the paediatric neurologic disorders in this part of the world, genetic disorders also play a role which cannot be overlooked.¹⁰ Congenital CNS anomalies and hydrocephalus accounted for a small proportion of childhood neurological disorders in this study. This is likely related to the fact that most of such children are seen in the neurosurgical unit of the hospital and does not necessarily suggest that these disorders are rare in this centre.

Paediatric neurological disorders are a major reason for paediatric specialist care in Ibadan, Nigeria. Preventable causes play a major role in the aetiology of the major neurological disorders seen in this part of the world.

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