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Profile and outcome of non-traumatic paraplegia in Kano, northwestern Nigeria

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Abstract

Aim: This study was aimed to identify the clinical and radiological profile of non-traumatic paraplegia and the various etiologies associated with the condition.

Materials and Methods: A review of the clinical and radiological presentations of adult patients presenting with non-traumatic paraplegia managed at the Aminu Kano Teaching Hospital (AKTH) and Murtala Specialist Hospital (MMSH), Kano, from June 2006 to November 2009 was carried out. Patients underwent a detailed clinical evaluation followed by laboratory investigation and neuroimaging studies and were followed up for 9 months to assess outcome and complications.

Results: 98 patients with non-traumatic paraplegia consisting of 71 males and 27 females (M:F: 5:2) were seen. The age range of the patients was between 16 and 76 years, with a mean age of 40 years (SD = 15.3) years; 54 (55%) of the patients presented after 2 months of the onset of paraplegia. The commonest symptoms were weakness of the lower limbs (100%), loss of sensation (55%), sphincteric disturbance (50%) radicular pain and paresthesia (38.4%), back pain (21.4%) and erectile dysfunction (40%). All the patients had X-ray of the spine; 26.3% had Magnetic Resonance Imaging (MRI) spine. The commonest etiological factors were tuberculosis (TB) (44.4%), transverse myelitis (13.1%), Guillain-Barre syndrome (9.1%), metastatic spinal disease (4%), and HIV myelopathy (4%). However, the cause could not be identified in 14 (14%) of the patients. The commonest site of affection in those with TB spine was lower thoracic (53.8%) and upper lumbar (23.1%) vertebrae.

Conclusion: Clinical profile of non-traumatic paraplegia in Kano, northwestern Nigeria, is similar to that reported elsewhere in Africa, with spinal tuberculosis and transverse myelitis accounting for over half the cases.

Keywords: Non-traumatic, outcome, paraplegia

Résumé

But: Cette étude avait pour but d'identifier le profil clinique et radiologique de paraplégie non traumatiques et les divers étiologies associés à la condition.

Matériaux et procédés: Un examen des présentations cliniques et radiologiques des patients adultes présentant non traumatique paraplégie géré à l'hôpital d'enseignement de Kano Aminu (AKTH) et l'hôpital de spécialiste Murtala (MMSH), Kano, de juin 2006 à novembre 2009 a été effectuée. Les patients ont subi une évaluation détaillée de la clinique suivie d'enquête et la neuro-imagerie des études en laboratoire et ont été suivies pendant 9 mois à l'issue des ânes et les complications.

Résultats: 98 patients atteints de paraplégie non traumatique consistant en 71 mâles et 27 femelles (M:F: 5: 2) ont été observés. Le tranche d'âge des patients a été de 16 à 76 ans, avec un âge moyen de 40 ans (SD = 15,3) ans. 54 (55%) de la patients présentés après 2 mois après le début de paraplégie. Les symptômes plus fréquentes étaient faiblesse du Bas membres (100%), perte de sensation (55%), la douleur radiculaire sphinctérien perturbation (50%) et paresthésie (38,4%), de retour douleur (21,4%) et la dysfonction érectile (40%). Tous les patients avaient des rayons x de la colonne vertébrale. 26,3% avaient résonance magnétique Colonne vertébrale d'imagerie (IRM). Les facteurs étiologiques plus fréquentes étaient myélite transverse (13,1%), de la tuberculose (TB) (44,4%), Guillain-Barre

syndrome (9,1%), la maladie de la colonne vertébrale métastatique (4%) et le VIH myélopathie (4%). Cependant, la cause pourrait ne pas être identifiée dans 14 (14%) des patients. Le site plus fréquente du posting dans ceux avec la colonne vertébrale de TB est plus faible thoracique (53,8%) et vertèbre lombaire supérieure (23,1%).

Conclusion: Le profil clinique de paraplégie non traumatique à Kano, nord-ouest du Nigéria, est similaire à celui rapporté ailleurs en Afrique, avec la tuberculose la colonne vertébrale et de la comptabilité de la myélite transverse pour plus de la moitié des cas.

Mots clés: Non traumatique, résultat, paraplégie

Introduction

Paraplegia or paraparesis could be defined as loss of function of both legs as a result of disease or injury of the spinal cord, spinal roots, peripheral nerves or myopathies. However, it could also result from certain parasagittal intracranial lesions. Paraplegia due to non-traumatic myelopathy is a disabling and distressing neurological disease with protean clinical presentations.

Studies of non-traumatic paraplegia from developing and tropical countries like Nigeria are relatively few and majority of the studies on paraplegia from Nigeria were carried out in the pre-magnetic resonance imaging era.^[1,2] These diagnoses were made solely on the basis of X-ray and myelography. Nevertheless, with the advent of Magnetic Resonance Imaging (MRI), which is a very sensitive modality for spinal lesions, the yield for positive diagnosis has greatly increased.

We aimed to identify the clinical and radiological profile of paraplegia and various etiologies in causation of paraplegia in the present study.

Materials and Methods

Ninety-eight patients with non-traumatic paraplegia or paraparesis, admitted into the ward or managed in outpatient Neurology Clinic of Aminu Kano Teaching Hospital (AKTH), a tertiary center with a wide coverage area, and Murtala Muhammad Specialist Hospital (MMSH), Kano, over a period of 4 years (2006–2009) were studied. The patients were predominantly from six northwestern states of Nigeria. Traumatic paraplegic patients were excluded.

Patients were clinically evaluated; all the patients had full neurological examination and even when a precise diagnosis could not be offered, the structure affected and the level of the lesion were identified.

The diagnoses were made based on clinical evidence and laboratory confirmation in a majority of the patients.

The laboratory investigations, depending on the suspected neurologic disease process, included full blood count, erythrocyte sedimentation rate (ESR), X-rays, Bence Jones protein, serological tests [HIV, venereal disease research laboratory (VDRL)], Mantoux test, serum biochemistry, cerebrospinal fluid (CSF) analysis and microbiology. Not all the patients who required MRI had it done because of financial constraints. MRI was said to be suggestive in the presence of a hyperintense spinal cord signal change in T2-weighted images which may extend over 3–4 vertebral segments or hyperintensity in the central two-thirds of spinal cord with a central dot.^[3-5] All the patients with suspected spinal cord disease (86 patients) had spinal X-ray.

Viral studies, nerve conduction test, electromyography (EMG), CSF electrophoresis, etc. were not utilized in these diagnoses because of unavailability of these facilities. Diagnosis of Guillain–Barre syndrome was in accordance with Asbury clinical and laboratory criteria.^[6] Diagnosis of chronic inflammatory demyelinating polyneuropathy (CIDP) was made in the presence of motor weakness more than sensory symptoms, symmetric involvement of the limbs, progression over at least 2 months, reduced deep tendon reflexes throughout, etc.^[4] Some of the in-patients were reviewed after discharge from the wards. However, some were lost to follow-up; therefore, ascertaining the disease progression and outcome was difficult.

Results

Ninety-eight patients consisting 71 (71.7%) males and 27 (27.3%) females satisfied the criteria for inclusion in the study (Male:Female = 5:2); 71 (71.7%) were paraplegics while 27 (27.3%) had paraparesis, i.e. muscle power greater than zero. Patients between the ages of 20 and 29 years were most affected while the least affected age groups were those below 20 years and those between 60 and 69 years [Table 1]. 44.9% of the patients were students, 83.7% of the patients were predominantly working class individuals with an age range from 20 to 59 years and 10.2% were artisans, being the least affected. 78% of the patients were married at one

time or the other out of whom 41.4% were separated principally on account of the illness. Majority of the patients (55.1%) had spent 2–4 months at home or with traditional health practitioners before presenting at the hospitals [Table 2].

Onset of weakness was gradual in 79 (80%) patients. The commonest symptoms included weakness of the lower limbs (100%), impairment of sensation with sensory level (55%), sphincteric disturbance (50%), etc. [Table 3]. Eighty of the patients had HIV screening with 14.1% of the patients confirmed positive.

Tuberculosis of the spine was the commonest cause of paraplegia. It accounted for 44.9% of the cases. Transverse myelitis and acute inflammatory demyelinating polyneuropathy accounted for 13.9 and 9.2%, respectively [Table 4]. Within the limits of the available investigations, the cause could not be identified in 14.3% of cases. Among the patients with TB spine, the radiological findings included wedge collapse, U-shaped destruction and vertebral planar [Table 5]. Lower thoracic (T6–T12) and upper lumbar (L1–L3) vertebrae were most commonly involved [Table 6].

Forty-four (44.9%) of the patients developed bed sores. The frequency of bed sore was higher (30%) among those with frank paraplegia compared to those with paraparesis (10%) at presentation and it was also higher among patients managed as outpatients (50%) compared to those managed in

the hospital (24%). Other complications identified were urinary tract infections (30%), respiratory tract infections (2%) and spasticity (14%).

Spinal tuberculosis cases were treated with rifampicin, isoniazid, ethambutol and pyrazinamide for a minimum of 9 months. Steroid was used in the case of inflammatory polyneuropathy and transverse myelitis.

Sixty-eight of these patients were followed up for more than 9 months. Among them, 20 patients walked unaided, 18 patients walked with crutches, 17 patients required some form of assistance to walk and 13 patients showed very little or no improvement. The earliest improvement in power was recorded after 1 week in patients with neuropathies. Most of those who did not show any neurological improvement after 4 months of therapy failed to show any further neurological improvement later. Three of the patients died from pulmonary thromboembolism. Recovery status of 27 patients was not documented because some defaulted and some were discharged against medical advice.

Discussion

Paraplegia or paraparesis is a condition associated with significant morbidity and attendant socioeconomic repercussions. It is regarded as a

Table 1: Age and sex distribution of the patients

Age range (years)	Sex		Total	Percent
	Male	Female		
<20	5	0	5	5.1
20–29	26	6	32	32.7
30–39	14	4	28	28.6
40–49	8	2	10	10.2
50–59	7	5	12	12.2
60–69	5	0	5	5.1
>70	6	0	6	6.1
Total	71	27	98	100

Table 3: Common clinical features

Features	Percent
Weakness of the lower limbs	100
Loss of sensation in the lower limbs	55
Sphincteric disturbance	50
Fever	44.9
Erectile dysfunction	40
Radicular pain and paresthesia	38.4
Back pain	21.4
Back swelling	21.4
Weight loss	16.3
Received treatment for pulmonary TB before	5.1

Table 2: Duration of illness before presentation

Delay before presentation (weeks)	Frequency	Percent
<1	25	25.5
1–4	19	19.4
8–12	28	28.6
12–16	26	26.5
Total	98	100

Table 4: Distribution of etiology

Etiology	Frequency	Percent
TB spine	44	44.9
Transverse myelitis	11	11.1
AIDP	9	9.2
Metastatic spinal disease	4	4.1
CIDP	4	4.1
HIV associated myelopathy	4	4.1
Subacute combined degeneration of the cord	3	3.1
Disc prolapse	2	2
Multiple Myeloma	2	2
Ischemic myelopathy	1	1
Unidentified	14	14.3
Total	98	100

TB = Tuberculosis, AIDP = Acute inflammatory demyelinating polyneuropathy, CIDP = Chronic inflammatory demyelinating polyneuropathy

Table 5: Radiological abnormalities in tuberculosis Spine

Abnormalities on X-ray	Percent
Wedge collapse	10
Complete destruction	8
U-shaped destruction	5
Planar vertebra	5
Pedicullar involvement	4
Paraspinal abscess + others	7

Table 6: Distribution of level of vertebral involvement in tuberculosis spine

Level of spinal abnormality	Frequency
T3-T6	5
T6-T12	21
L1-L3	9
L3-S5	4
Total	39

condition of tremendous misery to the patient, family and the society at large.

The patients included in this study were those seen in tertiary care centers. Hence, referral bias cannot be completely excluded. In addition, lack of necessary facilities and financial constraints, even where facilities were available, constituted a great limitation for the study; however, it is believed that information generated from this study will add to the body of knowledge of clinical profile of paraplegia in Nigeria.

The male preponderance of 72% possibly portrays differential gender hospital attendance pattern in the region of the study as women often require consents of their husbands to go to the hospital. A similar pattern has been reported in some other developing countries.^[7]

In this study, the patients who were most affected belonged to the working class, thereby the great economic impact on the society. This age distribution is similar to that found in northern Tanzania by Euan Scrimgeour.^[7]

Majority of the patients in this study had spent 2–4 months at home or with traditional health practitioners before seeking medical attention in the hospital. In the community where this study was carried out, patients are likely to seek traditional medical services first, as this disorder is often perceived to have spiritual undertone, hence the delay in seeking orthodox medical care and ultimately loss of working and earning capacity with serious socioeconomic impact. In addition, financial constraint is another reason why a large number of the patients present only when their disability is almost irredeemable. This finding is in keeping with experiences from other developing countries.^[2,7-11]

In our study, the commonest symptoms included weakness of the lower limbs, impairment of sensation with sensory level and sphincteric disturbance. However, among the patients with spinal tuberculosis, back pain was one of the most common modes of presentation. This finding is

in keeping with the report of Njoku *et al.* in their study of Potts paraplegia and paraparesis in a tertiary institution in Sokoto, northern Nigeria.^[11]

Tuberculosis was the commonest cause of paraplegia in this series. In studies reported in the other parts of Africa as well as developing countries outside the African continent, tuberculosis was the leading cause of paraplegia accounting for between 29.69 and 47% cases.^[2,12,13] Another study from Varanasi, India, on non-traumatic paraplegia reported tuberculosis as the commonest cause of compression paraplegia and was observed in 42 cases (33.33%) while quadriplegia was seen in only 3 cases (2.38%).^[14] However, in a Zimbabwean study, neoplasm was reported to be the commonest (28%) cause of non-traumatic paraplegia, followed by tuberculosis (27%).^[8] The involvement of lower thoracic spine (T6–12) and upper lumbar spine (L1–L3) was the most common. This is in concordance with findings of Hodgson *et al.*^[11] and Chaurasia *et al.*^[14] The spinal X-ray abnormalities seen in cases of tuberculosis in this study included wedge collapse, complete destruction, U-shaped destruction of the vertebral bodies, planar vertebra, pedicullar involvement, paraspinal abscess, etc. in order of reducing frequencies.

The second most common etiology in this study was transverse myelitis, majority of which were post viral infections. This finding is in agreement with that of Chaurasia *et al.*^[14] where transverse myelitis was the commonest cause of non-compressive paraplegia; however, their study included quadriplegia.

In some other studies, neoplasm is second to tuberculosis in the etiology of paraplegia,^[15] accounting for 4.1% of the cases. These neoplasms were all metastatic, 80% of which were prostatic and the remaining were from breast carcinoma. This figure is comparable to that obtained by Oshuntokun *et al.* in their study^[2] in southern Nigeria, with a figure of 5%. However, in other developing countries like in South India, it could be as high as 19%.

Of note is the absence of spinal schistosomiasis and nutritional myelopathies (with the exception

of subacute combined degeneration of the cord) as etiological factors in this study, unlike in some other studies in certain parts of West Africa, where it accounted for up to 27% of cases of paraplegia.^[2,16] Dietary dependence on maize in northern Nigeria rather than cassava in southern Nigeria and East Africa may account for the rarity of nutritional myelopathy in Kano.

In southern Nigeria, in the 70s, Oshuntokun described tropical ataxic neuropathy occurring from chronic cyanide poisoning due to cassava consumption.^[2] In our study, none of the cases, based on the clinical description given by Oshuntokun, fit into this syndrome. This may be due to dependence on maize and rice as the staple food or as a result of improved nutritional status of the studied population.

Few of these cases were clinically and biochemically identified as acute and chronic inflammatory demyelinating polyneuropathy (AIDP, CIDP). These patients did not have involvement of the upper limbs in the course of their illnesses. Those with CIDP had nerve conduction study done abroad. This finding is similar to those reported in other places in Africa.^[7,8]

Also of note is the rising cases of HIV associated myelopathy (HIVAM) in this study when compared to the previous studies in the developing or tropical countries. Hitherto, the prevalence of HIVAM was rather low or absent, particularly in the 70s, due to low or non-existence of the disease then.^[2,15] In 14.1% of cases in our study, a specific diagnosis could not be made. Similar studies in other developing or tropical countries have shown that 5–40% of cases remain undiagnosed because of delay in presentation, inadequate assessment, difficulty in interpreting the data obtained, to mention a few.

On discharge, 46% of those admitted had regained some degree of mobility ranging from walking with support to walking without support. This finding is comparable to that of Parry *et al* in their study.^[8]

In the developing countries, irrespective of the delay before presentation as shown in this study, a detailed neurological evaluation should be carried out when dealing with cases of paraplegia; this is necessitated by lack of the necessary investigative modalities. Although the neurological evaluation of paraplegia requires informed skill and a sound knowledge of neuroanatomy, the information generated by a detailed history and general examination, and a methodical neurological assessment should suffice to identify the affected structure and level of affection. Investigations should also be judiciously

chosen, and if spinal radiography and myelography are available, a rational working diagnosis should soon be established and appropriate treatment be commenced.

Conclusion

Clinical profile of non-traumatic paraplegia in Kano, northwestern Nigeria, is similar to that reported elsewhere in Africa with spinal tuberculosis and transverse myelitis accounting for over half the cases.

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