ORIGINAL ARTICLE

Epidemiology and Distribution of Polio Induced Deformities in Okigwe South Local Government Area, Imo State, South-East Nigeria

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Received: January 31st, 2013
Accepted: April 21st, 2013

ABSTRACT

Background: Poliomyelitis has remained endemic in Nigeria despite the efforts made by governments to eradicate the disease. The deformities arising from poliomyelitis (polio) make the establishment of rehabilitation centres a public health priority.
Objective: To study the epidemiology, nature and distribution of polio induced deformities at the Prosthesis and Orthotics Rehabilitation Centre in Okigwe, Imo State, South-East Nigeria.
Methodology: Two hundred and fifty case notes of polio deformed patients seen at the centre between 1986 and 1990 were studied. Simple statistical methods like percentages were used for data analysis.
Results: Out of the 250 cases studied, 150 (60%) were males while 100 (40%) were females. The age group most commonly affected by deformities was 6-10 years (35.6%) while the least was 16-20years (11.2%). The joints most affected by polio deformities were the knee (38%), ankle (34%) and hip (28%). The nature of deformities include: fixed flexion at the hip (28%), equinus foot deformity (17.6%), frail foot deformity (16.4%), knee hyperextension (22.8%) and valgus deformity of the knee (15.2%).
Conclusion: The study suggests that poliomyelitis is a major cause of musculoskeletal abnormality in the study area necessitating the use of orthotic devices in patients' rehabilitation. The public health importance of this finding is discussed.

Keywords: *Deformities, endemic, paralysis, rehabilitation.*

INTRODUCTION

Poliomyelitis or polio is an acute, viral, infectious disease spread from person to person primarily via the faeco–oral route.[1] Its causative agent, polio virus, was identified in 1908 by Karle Landsteiner.[2] Polio affects mainly children under the age of 5years and the infection could present in one of three ways namely subclinical (asymptomatic), non-paralytic or paralytic polio.[3]

Paralytic polio results when the virus enters the blood stream and gains access to the central nervous system, preferentially infecting and destroying the anterior horn cells that emerge as motor neurons, thereby leading to muscle weakness and acute flaccid

paralysis (AFP).[5] Polio induced paralysis can be of three types depending on the nerves involved. These include spinal polio (asymmetric paralysis involving most often the legs), bulbar polio (weakness of the muscles supplied by the cranial nerves), and bulbospinal polio (which is a combination of the first two).[6]

One out of every 200 cases of polio leads to irreversible paralysis hence the global co-operation by the World Health Organization (WHO), Rotary International, United States Centre for Diseases Control (CDC) and the United Nations' Children's Fund (UNICEF) to eradicate polio from the surface of the earth.[7] Despite the concerted efforts made by these World bodies to eradicate polio since 1988, the disease has continued to pose a threat to human wellbeing and happiness especially in developing countries including Nigeria, Afghanistan and Pakistan, countries where the disease is still endemic.[8,9,10,11]

Common post-polio deformities include equinus foot or hand, bone length discrepancies, scoliosis, and joint contractures all arising from skeletal muscle paralysis or paresis.[12] The management of these deformities requires the establishment of specialized rehabilitation centres which presents a unique public health challenge especially in developing countries where resources are limited. The present study was, therefore, designed as a retrospective epidemiological study to determine the nature, location, age and gender distribution of post- polio deformities at the Prosthesis and Orthotics Rehabilitation Centre in Okigwe, Imo State, South-East Nigeria.

METHODOLOGY

Study Area: The study was conducted at the Prosthesis and Orthotics Rehabilitation Centre in Okigwe, Okigwe South Local Government Area (LGA), Imo State, South-East Nigeria. The catchment areas include Abia, Enugu, Anambra and Rivers States.

Sample Population: A total of 250 cases of post-polio deformed clients who presented at the centre between 1986 and 1990 (5-year period) were studied.

Method of Sample Collection: After due clearance had been obtained from the Head of Management of the Rehabilitation Centre, the patients' case notes were retrieved from the Medical Records Department. Relevant information including the age and gender of patients, and nature and location of deformity were extracted from the records.

Statistical Analysis: Simple statistical methods such as percentages and ratios were used to analyze the data.

RESULTS

The results showed that males 150 (60%) were more affected by polio than females 100 (40%), and the most commonly affected age group was 6-10years 89 (35.6%), *Table 1*. Older children were least affected 28 (11.2%).

Table 1. Age and gender distribution of post-polio deformities at the prosthesis and Orthotics Rehabilitation Centre, Okigwe, Okigwe-South LGA, Imo State, South-East Nigeria

Age (years)	Male (%)	Female (%)	Total (%)
1-5	45(18%)	25(10%)	70(28%)
6-10	55(22%)	34(13.6%)	89(35.6%)
11-15	20(8%)	15(6%)	35(14%)
16-20	18(7.2%)	10(4%)	28(11.2)
>20	12(4.8%)	16(6.4)	28(11.2%)
Total	150(60%)	100(40%)	250(100%)

The most commonly affected joint of the body was the knee joint 95 (38%) followed by the ankle 85 (34%) while the least affected was the hip 70 (28%), *Table 2*.

Table 2. Topographic distribution of polio induced deformities at the Prosthesis and Orthotics Rehabilitation Centre

Joints	Frequency	Percentages (%)
Hip	70	28%
Knee	95	38%
Ankle	85	34%
Total	250	100%

The most frequent polio induced deformity was fixed flexion at the hip 70 (28%) while the least was valgus deformity of the knee joint 38 (15.2%), *Table 3*.

Table 3. Nature/type of polio induced deformities at the Centre

Nature of deformity	No. of Cases	Percentages
Fixed flexion at the hip	70	28%
Valgus deformity of the knee	38	15.2%
Knee hyperextension	57	22.8%
Frail foot deformity	41	16.4%
Equinus foot deformity	44	17.6%
Total	250	100%

DISCUSSION

The present study shows that polio induced deformities predominantly affect the lower limbs more than the upper limbs. This finding has been previously reported by Ajao and Oyemade.[13] Polio induces paralysis of the skeletal muscles of the limbs by destroying the anterior horn cells supplying these muscles. Polio induced paralysis become more obvious in adults than children, and the likelihood of developing paralytic polio is said to increase with age.[14] Of all the joints of the lower limbs, the knee joint was the most commonly affected by deformities (38%), followed by the ankle joint (34%). The hip was the least affected.

Considering the physiological importance of these joints, gross deformities involving them pose a serious threat to mobility hence, most of the affected individuals require one form of rehabilitation or another. In this environment (study area), most polio deformed individuals, either due to ignorance or poverty, prefer to beg on the streets for their survival instead of going to rehabilitation centres where they could be taught one form of trade or the other. This constitutes a public menace as these individuals fill the streets or major church gates begging for alms.

This study further shows that the highest number of polio induced deformities occurred in the age group 6-10years, followed by the age group 1-5years. Polio is regarded as a disease of children, but whenever it strikes in adults, its effects could be more severe and paralysis could be more devastating.[7,15] Several factors have been associated with increased risk of polio infection or its attendant post-polio deformities. Some of these factors include immune deficiency, malnutrition, tonsillectomy, and physical activity immediately following the onset of paralysis, skeletal muscle injury due to injection of vaccines or therapeutic agents, and pregnancy.[16,17,18,19,20,21] Of all these factors, skeletal muscle injury and malnutrition seem to be the most important in this environment.

The fight to halt the transmission of wild polio virus has been intensified in Nigeria, especially in the South-East Zone, where supplementary immunization activities (SIAs)

have been organized periodically by government. The major impediment towards effective control of polio in Nigeria, using oral polio vaccine (OPV) unfortunately reared its ugly head in the Northern part of the country where the administration of the oral vaccine was once rejected due to some religious misconception by some people. However, this problem has since been nipped in the bud by the Federal Government.

The present study also showed that most of the deformities involved the lower limb and consisted of fixed flexion at the hip (28%), knee hyperextension (22.8%), and equinus foot deformity (17.6%). These problems require orthotic rehabilitation and a lot of resources are needed, thereby making it an urgent need to establish and equip more rehabilitation centres to take care of these problems. Sachdeva and Gupta reported great variations in the nature and site of deformities occasioned by polio infection.[22] Agarwal and Goel have recommended the establishment of specialized rehabilitation centres to take care of these patients where rehabilitation programmes should be mapped out for individual cases and emphasis placed on regular follow up and management.[23]

It is surprising that despite the huge resources invested in the fight to eliminate polio in Nigeria, the disease has remained endemic especially in the northern parts of the country. The resurgence of polio in some countries in West Africa, hitherto regarded as polio-free, has been blamed on this situation. Thus, the incidence of polio in countries like Ghana, Chad and Burkina Faso has been attributed to the export of the wild polio virus from Nigeria.[24]

CONCLUSION

The public health importance of polio and its deformities cannot be overemphasized. The huge resources spent on its control and rehabilitation of affected individuals could have been channeled to other areas of development such as infrastructures. With more commitment from governments and co-operation from the populace, Nigeria will one day win the war against poliomyelitis and achieve the status of polio free country like the United States and Britain.

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ACKNOWLEDGEMENT

The authors are very grateful to the management and staff of the Prosthesis and Orthotics Rehabilitation Centre Okigwe for their co-operation and support throughout the study.