



CLINICAL PROFILE OF ACUTE FLACCID PARALYSIS IN A TERTIARY CENTRE IN SOUTH-SOUTH, NIGERIA

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Background Surveillance of acute flaccid paralysis (AFP) was an important public health activity in many countries prior to the eradication of Poliomyelitis. Following the eradication of Polio in Nigeria and globally, it is paramount to identify other major contributors to clinical burden of AFP. This study was designed to describe the epidemiology, clinical characteristics, and differential diagnosis of causes of AFP over a 10 year period in a tertiary hospital.

Methods: The case notes of patients who were admitted in the Paediatric Neurology unit of the University of Calabar teaching hospital with clinical features suggestive of AFP cases between January 2011 and December 2020 were studied. They were diagnosed on the basis of history and physical examination. The underlying aetiology was ascertained by appropriate investigations such as cerebrospinal fluid analysis, electrolytes and imaging.

Results: Acute flaccid paralysis accounted for 0.02% of all admissions into the Neurology unit over the study period. Out of 20 patients with AFP, 7 had acute inflammatory demyelinating polyneuropathy, a subtype of Guillain-Barré syndrome (GBS), Acute disseminated

encephalomyelitis 3 (15%), Transverse myelitis 3 (15%), Myasthenia gravis 2 (10%),

Meningoencephalitis 1(10%), Traumatic neuritis 3 (15%) and Acute hemiplegia of childhood 2 (10%). There was no case of Poliomyelitis. The greater proportion of the patients studied were from the 10-15 age group. There were more females in the study population with a Male to Female ratio of 1:1.2

Conclusion: Non-polio cases were the causes of AFP in Calabar. GBS was the most common cause of AFP followed by traumatic neuritis and ADEM. Paraplegia and fever were common clinical presentations.

Keywords: Acute flaccid paralysis, Guillain-Barre syndrome, traumatic neuritis, poliomyelitis

INTRODUCTION.

The World Health Organization (WHO) defines acute flaccid paralysis (AFP) as the sudden onset of weakness or paralysis of a limb, characterized as flaccidity, in a child younger than 15 years of age progressing to maximum severity within 1–10 days.¹ The term ‘flaccid’ indicates the absence of spasticity or other signs of disordered central nervous system motor tracts such as hyperreflexia,

clonus, or extensor plantar responses.¹ AFP is the most common sign of acute [poliomyelitis](#). Surveillance for AFP was among the cardinal strategies adopted for monitoring the progress of polio eradication. AFP is a complex clinical syndrome with several different aetiologies including paralytic polio caused by wild poliovirus or circulating vaccine-derived poliovirus, Guillain-Barre syndrome (GBS), transverse myelitis, traumatic neuritis, acute disseminated encephalomyelitis, tick paralysis, infant botulism, encephalitis, brain tumors, spinal cord compromise, meningitis, cardiovascular accident, myopathies, neuropathies and hypokalemic periodic paralysis, myasthenia gravis and alternating hemiplegia of childhood.²⁻⁶

WHO estimates a background annual incidence of at least 1 case of AFP per 100,000 individuals less than 15 years old, in the absence of wild poliovirus transmission.^{7,8} In the decade of final polio eradication, Nigeria was among the last 3 polio endemic countries. Now that Polio has been eradicated in Nigeria and globally, it is paramount to identify other major contributors to clinical burden of AFP. In our environment, Traumatic neuritis has been identified as a possible cause of AFP. Traumatic Injection Neuritis (TIN) is an iatrogenic condition caused by unsafe intramuscular (gluteal) injection practices. GBS is the most common cause of AFP worldwide.⁹ Recently, GBS has also been reported in association with [COVID-19](#) infection, and may be a potential neurological complication.¹⁰ The identification of AFP cases and its causative factors are important in the management & prevention of the disease. This study was designed to describe the epidemiology, identify the clinical characteristics, and differential diagnosis of causes of AFP in the past 10 years in a tertiary hospital.

METHODOLOGY

Retrospectively, data was extracted from the case notes of patients who were admitted in the Paediatric Neurology unit of the University of

Calabar teaching hospital with features suggestive of AFP between January 2011 and December 2020. They were diagnosed on the basis of history and physical examination.

The underlying aetiology was ascertained by appropriate laboratory investigations such as cerebrospinal fluid analysis, electrolytes. Brain and spinal imaging and stool sample were done when indicated.

The following information from the cards was then entered into a spreadsheet specifically designed for the study: age, gender, immunization history, clinical history and examination findings and specific clinical diagnosis.

Inclusion Criteria:

Children from 1 year to less than 15 years old with acute flaccid paralysis in one or more limbs without signs suggestive of spasticity were included.

Exclusion Criteria:

Children with signs of upper motor lesion were excluded from the study.

Statistical analysis

Data was entered into a computer database and SPSS software (SPSS Inc., Chicago, IL, USA, version 21.0) and double checked before analysis. Data were analysed by proportions and percentages. The frequency distributions of various items were composed and presented in tables and charts.

RESULTS

Acute flaccid paralysis accounted for 20 (0.02%) out of 833 admissions into the Neurology unit over the study period. The gender distribution pattern of AFP cases showed a male to female ratio of 1:1.2. (Table 1) The 10-15 age group accounted for the highest proportion (55%) of the case of AFP.

Out of 20 patients with AFP, 7 (35%) had acute inflammatory demyelinating polyneuropathy, a subtype of Guillain-Barré syndrome (GBS), Acute disseminated encephalomyelitis 3 (15%), Transverse myelitis 3 (15%), Myasthenia gravis 2 (10%), Meningoencephalitis 1 (10%), Traumatic neuritis 3 (15%) and Acute hemiplegia of childhood 2 (10%). (Fig 1) None had Poliomyelitis. Paraplegia was the commonest clinical presentation (Fig 2) All the cases with available immunization records had completed OPV immunization.

Table 1: Age and Gender distribution of cases of different aetiologies of AFP

Variable	Aetiology of AFP							Total	%
	GBS	ADEM	TM	INJ. NEURITIS	ENCEPHALITIS	MYASTHENIA GRAVIS	AHC		
	7	3	2	3	1	2	2		
Age									
O-5	2	1	0	1	1	0	2	7/20	35
6-10	0	0	0	2	0	0	0	2/20	10
11-15	5	2	2	0	0	2	0	11/20	55
Gender									
M	4	2	1	1	0	0	1	9/20	44
F	3	1	1	2	1	2	1	11/20	55

GBS – Guillain-Barré syndrome

TM - Transverse myelitis

AHC - Alternating hemiplegia of childhood

Fig 1. Aetiology of Acute flaccid paralysis

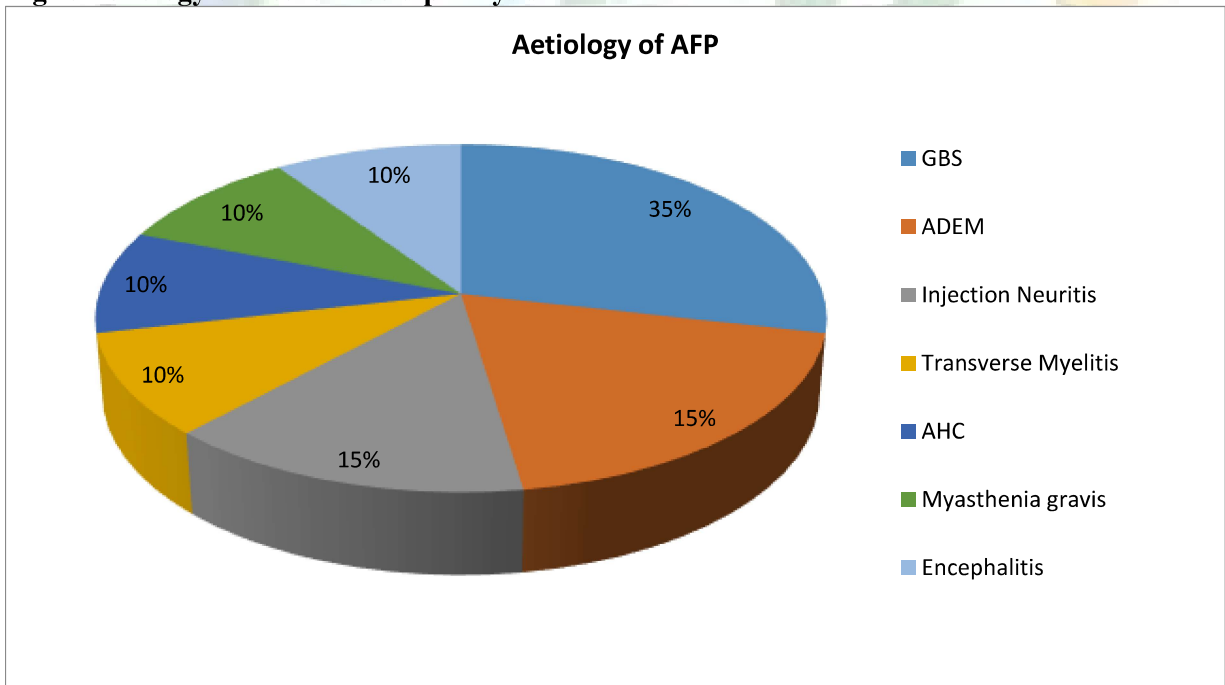


Table 2: Clinical features of acute flaccid paralysis.

Clinical feature	Frequency	Percentage
Fever		
Yes	9	45
No	11	55
Residual paralysis		
Monoplegia	4	20
Hemiplegia	2	10
Paraplegia	9	45
Quadriplegia	5	25
Paralysis		
Symmetric	14	70
Assymmetric	6	30
Sensory Involvement		
Yes	12	60
No	8	40
Respiratory depression		
Yes	3	15
No	17	85
Sphincter Involvement		
Yes	12	60
No	8	40
Vaccination		
Yes	19	95
No records	1	5

DISCUSSION:

This study showed that the frequency of AFP was higher in female children (55%) with a male to female ratio of 1:1.2. This was similar to the study by Reyman et al¹¹ in Pakistan that reported a slight female percentage of 51.5%. This is in contrast to other studies^{12,13,14} which showed slight male preponderance. Hamzat¹³ in a study in Ibadan reported a male to female ratio of 1.2:1 among paediatric population.

This study showed that age group above 10yrs were more affected. This is consistent with a study in Pakistan by Ali et al¹² where 60% of cases were above 10yrs. However other studies^{14,15} reported lower percentages and showed that the under 5 group were more affected and possibly explained by more vulnerability to infections in younger age children. It has been documented that the relative risk for GBS (which had the highest frequency in our study) according to sex varied with age.¹⁶

GBS was the leading cause of AFP in our study with 35%. This is similar to the study by Saraswathy et al¹⁷ conducted in Malaysia where GBS contributed 32.2 % of

cases of AFP. Similarly a study by Khuzwayo¹⁸ in 2013 in South Africa showed that 42.7% of the AFP cases were caused by GBS.⁹ Injection neuritis was a joint second cause of AFP in this study accounting for 15% of all AFP cases. This is supported by other Nigerian based studies.^{5,11,19} where TIN was a major contributor to the burden on non-polio AFP. Similarly a study in Pakistan reported that Injection neuritis was the second highest non-polio cause of AFP behind GBS.¹² The relatively high occurrence of sciatic nerve palsy as a cause of AFP calls for more efforts at all levels to prevent and manage traumatic neuritis.

In this study the most common clinical characteristics were fever at onset of the AFP (45%) and more involvement of the lower limbs compared to the upper limbs. This finding of paraplegia and fever is similar to a study in Jordan.²⁰ This further highlights the role of infections in the aetiology of GBS which is the major contributor of AFP. Although not classically attributed to the disease process of GBS, fever at the onset of paralysis is reported from previous studies and may be attributed to the effect of the triggering infectious disease.²¹

Almost one-third of the patients had asymmetric paralysis, this is corroborated by a study in Iran.⁹ This could be explained by the high contribution of traumatic neuritis in our study.⁴

The three cases with respiratory depression succumbed to the illness. Respiratory depression is the most immediate life-threatening symptom of Guillain-Barré syndrome, cervical spine involvement in Transverse myelitis and Myasthenia gravis. All but one case had vaccination records showing full vaccination for polio. This is a reflection of a good vaccination coverage through efforts made by government to strengthen routine and supplemental immunization over time to eradicate polio.

CONCLUSION

In conclusion, this study revealed that Guillain-Barré syndrome (GBS) was the leading cause of AFP among children followed by traumatic neuritis and ADEM. No case of Poliomyelitis was identified in the cases reviewed. Fever and paraplegia were the most prevalent clinical signs at onset.

Recommendation

It is recommended that concerted efforts should be made towards prevention and improved management of Traumatic neuritis which is a significant and preventable cause of AFP. Increased AFP-based awareness and provision of high-quality health services that is accessible and affordable will go a long way in reducing morbidity and mortality associated with AFP.

Conflict of interest

The authors declare no conflict of interest.

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