

Clinico-Epidemiological Study of Acute Flaccid Paralysis at N.S.C.B. Medical College, Jabalpur

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Abstract

Background: Acute flaccid paralysis (AFP) is the sudden onset of weakness and floppiness in any part of the body in a child under the age of 15 or if a clinician suspects polio in any person of any age, excluding adults, spastic paralysis, old cases, or cases with apparent causes such as trauma. This study aims to know the epidemiology and clinical characteristics to describe the incidence and differential diagnosis of potential causes of AFP in the Jabalpur region and will be supported by polio surveillance.

Materials and Methods: An institution-based prospective study included all cases fulfilling the AFP case definition. History, clinical examination, and necessary investigations were performed, and the required treatment was given. Regular follow-ups were done, and the final classification was made along with the AFP surveillance team. Statistical analysis was done using predesigned proforma and analyzed using statistical software -S.P.S.S. version 21 & Medcalc 19.5.

Results: Out of 119 patients, the majority were male, belonged to a low socioeconomic category, and most of their father's occupations were manual (63.9%). The provisional findings showed that the majority of the cases were due to GBS 30.3% followed by 14.3% dyselectrolytemia, 8.4% isolated facial palsy, 7.6% viral myalgia, 6.7% hemiparesis, 4.2% paraplegia, 2.5% meningitis, 2.5% meningoencephalitis, 2.5% traumatic neuritis, 1.7% quadriplegia, 1.7% adp, 0.8% floppy neck, 7.6% unknown and 9.2% other. Fever and sensation loss were present in 30.3% and 92.4%, respectively. It was also found that other parameters' distribution was not statistically significant except for the parameters listed.

Conclusion: AFP was more common in males, especially those from low socioeconomic categories whose father's occupation was manual. Moreover, G.B.S. was one of the common causes of AFP, and it could be the most common differential diagnosis among all AFP included.

Keywords: Acute Flaccid Paralysis, Guillain Barre Syndrome, Clinico-Epidemiological Study.

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Introduction

The World Health Organisation (WHO) defines acute flaccid paralysis (AFP) as the sudden onset of weakness and floppiness in any part of the body in a child under the age of 15 or if a clinician suspects polio in any person of any age, excluding adults, spastic paralysis, old cases, or cases with apparent causes such as trauma. (Marx A et al., 2000; Growdon JH and Fink JS, 1994) Numerous illnesses can cause AFP, with poliomyelitis being one of the most important differential diagnoses. [1] Guillain-Barre syndrome (G.B.S.), transverse myelitis, traumatic paralysis, and occasionally other neurotropic viruses such as Rabies and Japanese encephalitis are frequently misdiagnosed with polio. (Chaudhary S et al., 2014) [2]

In any case of AFP, the potential of polio should be considered. Polio eradication is based on the WHO's four-pronged eradication strategy: 1) routine immunization with oral polio vaccine (OPV); 2) additional doses of OPV administered nationwide during National Immunisation Days (N.I.D.s); 3) mopping up immunization activities to catch any children under the age of five who may have been missed during stages one and two; and 4) enhanced surveillance for all cases of AFP and wild poliovirus. WHO has created guidelines to assess the effectiveness of surveillance systems in each country, whether polio-endemic or not, to detect at least two cases of AFP not caused by polio in every 100,000 children under the age of 15. (Chaudhary S et al., 2014) [3]

Since 1988, when the Global Polio Eradication Initiative was established (350 000 cases; >125 endemic countries), polio cases have fallen by more than 99%. Only sections of four nations were endemic for polio in 2010. These were Pakistan, Afghanistan, Nigeria, and India. However, 23 previously polio-free countries were reinfected due to virus imports in 2009-

2010. The total number of polio cases worldwide decreased significantly in 2011. After a year of having no cases of wild poliovirus, India was removed from the list of polio-endemic nations on January 13, 2011. [4,5]

Unlike other studies, which are important from the epidemiological point of view because the WHO is running a polio eradication campaign, our study was not only conducted to know the epidemiology but also clinical characteristics to describe the incidence and differential diagnosis of potential causes of AFP in Jabalpur region as well as will be supported to the polio surveillance. [6]

Methodology

An Institution-based prospective study was performed at the Department of Pediatrics N.S.C.B. Medical College Jabalpur on 119 patients for two years.

Patients of age group 1 month to age ≤ 14 years presenting with Acute Flaccid Paralysis (AFP) in any form, including acute encephalopathy or Acute Encephalitis Syndrome (A.E.S.), were included in the study. However, patients with age >14 yrs, spastic paralysis, old cases or cases with obvious causes like trauma, apparent congenital anomalies or birth defects, and A.E.S. without acute flaccid paralysis were excluded from the study.

The study started by reviewing AFP case investigation forms (C.I.F.). These C.I.F. were filled by the hospital resident doctor or Surveillance Medical Officer (S.M.O.) of the National Polio Surveillance Project (N.P.S.P.) and collected by SMO NPSP. C.I.F. of AFP cases was returned to an author after full investigation and final classification by S.M.O. as a routine as the author works as a nodal officer of poliomyelitis surveillance for the hospital. All the children diagnosed as a case of AFP during active AFP surveillance (as per WHO definition, i.e., any child under 15

years of age with AFP or any person of any age with paralytic illness, if polio is suspected) were included in the study.

The relevant study variables included presenting features were fever, convulsions, altered mental status, loss of consciousness, headache, vomiting, sensation loss, neck pain, and preceding viral illness; C.N.S. higher function examination; motor system examination; cranial nerve examination; sensory nerve examination; musculoskeletal system examination; cerebral examination; spinal system examination; on clinical examination Glasgow coma scale (G.C.S.); axillary temperature; on neurological examination, mental status; children with altered sensorium and unconsciousness;

deep tendon reflexes; quadriparesis; paraparesis; hemiparesis; dyselectrolytemia in the form of hypokalemia; lumbar puncture; C.T. scan head; stool examination.

Statistical analysis plan

The data were recorded in the predesigned proforma, then entered in the M.S. Excel, and eventually, it was analyzed using statistical software -S.P.S.S. version 21 & Medcalc 19.5.

Results

Demographic characteristics like age distribution, gender, domicile distribution, travel history, and father's occupation and season-wise distribution are depicted in (Table 1).

Table 1: Demographic data

Parameters	Mean±SD/ Percentage
Age distribution	6.86 ± 3.42
Gender	
Female	36.1
Male	63.9

We found that most of the AFP patients were from the low socioeconomic category, and the majority of their father occupations were manual (63.9%), followed by semiprofessional (21.8%), skilled (8.4%),

and semiskilled (5.9%). Among the season-wise distribution of patients, most of the patients were found in the monsoon season (63%), followed by autumn (14.3%), summer (12.6%), and winter (10.1%).

Table 2: Distribution of parameters at the onset of paralysis among AFP patients

Distribution at the onset of paralysis among AFP patients	Percentage
Immunization status	69.7
Fever	69.7
Ascending/ descending paralysis	
Ascending paralysis	77.3
Descending paralysis	14.3
Respiratory involvement	23.5
Bulbar involvement	34.5
Bladder involvement	0
Joint pain	64.7
Gait involvement	82.4

Our findings suggest a 100% decrease in all AFP patients' tone, power, and ad reflex, while sensation loss was observed in 110 (92.4%) patients.

Findings from the final provisional diagnosis showed that majority of the cases were due to GBS 30.3% followed by 14.3% dyselectrolytemia, 8.4% isolated facial palsy, 7.6% viral myalgia, 6.7%

hemiparesis, 4.2% paraplegia, 2.5% meningitis, 2.5% meningoencephalitis, 2.5% traumatic neuritis, 1.7% quadriplegia, 1.7% adp, 0.8% floppy neck, 7.6% unknown and 9.2% other. Fever and sensation loss were present in 30.3% and 92.4%, respectively. It was also found that other parameters' distribution was not statistically significant except for the parameters listed.

Discussion

In this study, male (63.9%) preponderance was seen, similar to the findings of a study done by D'Souza et al., 1999; Morris et al., 2003 and Khona et al., 2017. It has been reported that one of the dominant risk factors for G.B.S. is sex which is supported by a study that suggested that the incidence of G.B.S. is 1.50 times more common in men than women. (Ansari B et al, 2018) [7]

The mean age of cases was 6.86 ± 3.42 years in the present study, while the median age of AFP cases was 6 years 10 months in a study done by D'Souza et al., 1999. Most of the cases (63%) were between 5 and 12 years in our study, similar to another study that showed the same results. (D'Souza RM et al., 1999) However, Memon et al. [8] found most cases in a 2-5 age group in their study. (Memom et al., 2010) In addition, our study findings reported 95 patients (70.8%) from rural areas, while 24 patients (20.2%) were from urban areas. Our results concord with a study by Kumar that showed similar findings (76%). (Kumar A, 2015) Most of the AFP patients in our study were from the low socioeconomic category, and the majority of their father's occupation was manual (63.9%) that followed by semiprofessional (21.8%), skilled (8.4%) and semiskilled (5.9%). These findings are supported by other studies also. (Kumar A, 2015; Hennessey KA et al., 2000) Among the season-wise distribution of patients, most of the patients were found in the monsoon season (63%), followed by autumn (14.3%), summer (12.6%), and winter (10.1%) in the present study.

However, Webb et al. reported that a high incidence was noticed in the winter season finding. (Webb AJS et al, 2015) [9]

Furthermore, our study findings showed that out of 119 cases, 69.7% of AFP patients were immunized and were found concordant with the previous study. (Kumar A, 2015) Out of 119 cases, 69.7% of AFP patients had a fever at the onset of paralysis. There were 92 cases (77.3%) of ascending paralysis while descending paralysis cases were 17 (14.3%) and 10 (8.4%). These findings were partially similar to the study reported by Mohsin and Asimi. (Mohsin N and Asimi R, 2017)

Out of 119 cases, 69.7% had fever at the onset of paralysis, 91 (76.5%) had respiratory involvement, 78 (65.5%) had bulbar involvement, 100% had bladder involvement, 77 (64.7%) had joint pain, 77 (64.7%) gait involvement, 83 (69.7%) travel history, 100% decreased tone, power, and reflex and 110 (92.4%) were had sensation loss. These findings were partial to complete, similar to the studies reported by various researchers. (Kumar A, 2015; Armyta DN, 2019) Results from the final provisional diagnosis showed that majority of the cases were due to GBS 30.3% followed by 14.3% dyselectrolytemia, 8.4% isolated facial palsy, 7.6% viral myalgia, 6.7% hemiparesis, 4.2% paraplegia, 2.5% meningitis, 2.5% meningoencephalitis, 2.5% traumatic neuritis, 1.7% quadriplegia, 1.7% adp, 0.8% floppy neck, 7.6% unknown and 9.2% other. [10,13]

Various data analyses of AFP cases over the last two decades have consistently reported G.B.S. as the most common cause of non-polio AFP worldwide, with a frequency ranging from 20% in Oman (Halawa et al., 2011) to 72.2% in Central America. (Moliner MR et al, 1999) Primarily the frequency of G.B.S. lies between 32.3% and 47.29%. [14] (Saraswathy TS et al., 2008) Although the results of our study confirm the rest of the national and international literature in having G.B.S. as

the most frequent cause of non-polio AFP, the frequency stands on the higher side at 54.7%, which may be because of the cumulative frequency of G.B.S. across all age ranges, unlike to most other studies carried out in children. The distribution of variables with the provisional diagnosis was also studied, and Rural/Urban locality, joint pain, Gait involvement, and fever at the onset of paralysis were statistically significant. In contrast, others were not significant with provisional diagnosis. [15,16]

Conclusion

We conclude that in our study, AFP was more common in males, especially from low socioeconomic categories whose father's occupation was manual. Moreover, G.B.S. was one of the common causes of AFP, and it could be the most common differential diagnosis among all AFP included. The differential diagnoses of AFP were G.B.S., dyselectrolytemia, isolated facial palsy, viral myalgia, hemiparesis, paraplegia, meningitis, meningoencephalitis, traumatic neuritis, and others. The distribution of other parameters was not found to be statistically significant.

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