

Epidemiological characteristics of Acute Flaccid Paralysis cases, Al Najaf Al Ashraf Province, Iraq, 2023-2024

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ABSTRACT

The World Health Organization (WHO) defined an Acute Flaccid Paralysis (AFP) case “as a child presenting with sudden onset of floppy paralysis or muscle weakness due to any cause, or any person of any age with paralytic illness if poliomyelitis is suspected by a clinician”. The study aims to describe epidemiological characteristics of Acute Flaccid Paralysis cases. This study follows a retrospective descriptive design and was implemented in Najaf province; the period of study was from 1 January, 2023 to 31 of December of 2024. The data was collected and reviewed from the patient’s files and surveillance records of all AFP cases. Demographic data include Age, Gender, Residency, vaccination status. Cumulatively, 77 AFP cases were reported to the Najaf between January 2023 and December 2024. Of all cases, 42 (54.5%) were of patients in ages of less than 5 years, and 45 (55.8%) were male. 43 (55.8%) of cases in urban and for Vaccination status 72 (93.5%) were vaccinated. The data indicate that the most commonly affected sites are the lower limbs, with 79.2% of cases involving the left leg and 76.6% involving the right leg. The analysis of risk factors for Acute Flaccid Paralysis (AFP) in Najaf suggests that sex (OR = 1.122, p = 0.694) and residence (OR = 0.893, p = 0.085) are not significantly associated with AFP risk. However, vaccination status (OR = 0.110, p = 0.024) shows a statistically significant protective effect.

Keywords: Acute Flaccid Paralysis, Najaf, Poliomyelitis.

1. INTRODUCTION

Acute Flaccid Paralysis (AFP) is a severe clinical symptom that could have a variety of different causes. AFP is a clinical symptom characterized by the sudden onset of weakness or paralysis and decreased muscle tone (less periodic muscles of the respiratory tract). It occurs in 0.1–1% of infected cases and is the most frequent clinical manifestation of acute poliovirus infection^[1]. The World Health Organization (WHO) defined an AFP case “as a child presenting with sudden onset of floppy paralysis or muscle weakness due to any cause, or any person of any age with paralytic illness if poliomyelitis is suspected by a clinician”^[2]. As the gold standard for poliomyelitis case detection, acute flaccid paralysis (AFP) surveillance is an important method for monitoring progress toward the global eradication goal of poliomyelitis^[3]. AFP surveillance helps to detect reliably areas where poliovirus transmission is occurring. Thus, AFP surveillance data will guide targeted immunization activities in areas with continued wild poliovirus circulation^[4]. Iraq has been free of vaccine-derived polioviruses (VDPV) and wild poliovirus (WPV) since 2014 when two cases of wild poliovirus were confirmed after a 14-years absence^[5]. Even one case is classified as an outbreak in this period of polio eradication, and precautions should be taken, typically within 48 hours of being informed of the case^[6]. Iraq as well as Syria, Libya, and Yemen were added to the already existing 16 priority countries because they were fragile, or conflict-affected states, which makes Iraq one of the priority countries that was identified as being "medium-high" risk of having persistent gaps in surveillance and being chronically vulnerable to poliovirus transmission^[7].

Aim of study

The study aims to describe epidemiological characteristics of Acute Flaccid Paralysis cases, Al Najaf Al Ashraf Province, Iraq, 2023-2024

2. METHODOLOGY

Study Design and Site Selection:

This study follows a retrospective descriptive design and was implemented in Najaf province; the period of study was from 1 January, 2023 to 31 of December of 2024. The target population for the study was all patients who reported to the surveillance unit in Najaf health directorate as acute flaccid paralysis during the study period. Al Najaf is a religious sacred city presented in the middle of Iraq about 160 KM southwest Baghdad with a population of about 1.4 million people. Rural area represents about 30% of Najaf. Acute flaccid paralysis is a notifiable disease in Najaf and all health facilities should report all suspected cases to the provincial surveillance unit within 24 hours, at the same time, the local health authorities are required to carry out an epidemiological investigation for all notified cases, which includes obtaining specimens for laboratory confirmation. The data was collected and reviewed from the patient's files and surveillance records of all AFP cases. Demographic data include Age, Gender, Residency, vaccination status. Results were sought.

Acute Flaccid Paralysis Diagnosis:

Diagnoses were based on the clinical case descriptions and laboratory confirmation criteria. case is defined as Any patient under 15 years of age with acute, flaccid paralysis, or any person of any age in whom a clinician suspects polio. It can also be diagnosed through signs and symptoms such as high fever, limb flaccidity, gastrointestinal disorders, upper respiratory tract infections, as well as neurological reflexes.

Data analysis:

Data was entered into MS Excel and this was later transferred and analyzed using SPSS version 26. Frequency and percentages are provided to describe the characteristics of AFP case, and the association among groups was tested by P-value test at 5% of significance level and we calculated odds ratios (ORs) to examine the association between several independent variables (sex, residence and vaccine status) and AFP case status. The precision of the results was assessed with 95% confidence intervals (CIs).

Result

Cumulatively, 77 AFP cases were reported to the Najaf between January 2023 and December 2024. Of all cases, 42 (54.5%) were of patients in ages of less than 5 years, and 45 (55.8%) were male. 43 (55.8%) of cases in urban and for Vaccination status 72 (93.5%) were vaccinated (Table 1). all cases (77,100%) of had Paralysis acute and floppy, while 59 (76.6%) of cases had fever (Table 2). The data indicate that the most commonly affected sites are the lower limbs, with 79.2% of cases involving the left leg and 76.6% involving the right leg. Additionally, bilateral lower limb paralysis was observed in 62.3% of cases (Table 3). Regarding neurological findings, neck stiffness (70.1%) were noted, though the high percentage for neck stiffness warrants verification. Abnormal muscle tone (96.1%) was a predominant finding, reinforcing the characteristic motor involvement of AFP. The most frequently observed symptoms include coryza (54.5%), tonsillitis (48.1%), and vomiting (42.9%), indicating that many cases presented with upper respiratory or gastrointestinal symptoms. Nausea (32.5%) and diarrhea (11.7%) were also reported (Table 4). The analysis of risk factors for Acute Flaccid Paralysis (AFP) in Najaf suggests that sex (OR = 1.122, p = 0.694) and residence (OR = 0.893, p = 0.085) are not significantly associated with AFP risk. However, vaccination status (OR = 0.110, p = 0.024) shows a statistically significant protective effect, indicating that vaccinated individuals are less likely to develop AFP (Table 5).

Table (1): Demographic characteristics of acute flaccid paralysis cases, Najaf 2023-2024

Characteristic		F	%
Age group/years	<5	42	54.5
	5-10	28	36.4
	11-15	7	9.1
Sex	Male	45	58.4
	Female	32	41.6
Residency	Urban	43	55.8
	Rural	34	44.2
Vaccination status	Un vaccinated	5	6.5

	Vaccinated	72	93.5
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Table (2) Descriptive epidemiology of 77 acute flaccid paralysis cases reported in Najaf between January 2023 and December 2024.

Clinical symptoms	Value n,(%)
Paralysis acute	77 (100)
Paralysis flaccid	77 (100)
Fever	59 (76.6)
Paralysis Asymmetrical	25 (32.5)
Sensory loss	2 (2.6)

Table (3) Distribution of Acute Flaccid Paralysis cases by site of paralysis. Najaf 2023-2024

Site of paralysis	Value n,(%)
Left Leg	61 (79.2)
Right Leg	59 (76.6)
Left Arm	9 (11.7)
Right Arm	10 (13)
Both arms	8 (10.4)
Both Legs	48 (62.3)
Breathing muscles	2 (2.6)
Neck muscles	4 (5.2)
Facial muscle	1(1.3)

Table (4) Neurological Clinical Examination of acute flaccid paralysis cases reported in Najaf between January 2023 and December 2024

Sign or Symptom	Value n,(%)
Diarrhea	9 (11.7)
Nausea	25 (32.5)
Vomiting	33 (42.9)
Coryza (cold, runny nose)	42 (54.5)
Tonsillitis	37 (48.1)
Constipation	5 (6.5)
Sphincter control	8 (10.4)
Neck stiffness	54 (70.1)
Muscle tone/grade	74 (96.1)

Table (5): Risk Factors of AFP, Najaf 2023-2024

Risk factor	Odds ratio	Confidence interval	P_ value
Sex	1.122	(0.314 -2.163)	0.694
Residence	0.893	(0.344 - 2.317)	0.085
Vaccination status	0.110	(0.012 -1.042)	0.024

3. DISCUSSION

The study reported that half of the reported cases were of patients below 5 years of age, which is consistent with findings of a study conducted in Jordan^[8] and another one in Iran^[9] Because this age group may have resulted in high sensitivity among healthcare providers and led to high reporting. Of all cases, the number of male exceeded the number of female, a finding also reported in other studies^[10-12] women have stronger humoral and cellular immune responses to infection or antigen stimulation^[13]. Higher incidence was reported in patients from Urban areas (55.8%) than in patients from Rural areas (44.2%) This finding is similar to that in Baghdad^[14]. As for the site of paralysis, it was most common in the Left Leg and Right Leg (79.2%,76.6%) respectively, this finding agreement with other study in Nigeria^[15]. Almost of the patients (76%) had fever, and approximately one-third of the patients had asymmetric paralysis, the presence of fever in cases in the present study may be attributed to the fact that majority of the cases was reported by clinics where cases when to seek health interventions. This finding is similar to that in Iran^[9]. Vaccination status was 93.5% of all AFP cases reported were vaccinated. A similar finding was revealed in Bangladesh^[10]. Muscle tone/grade was recorded in (96.1%) of cases, this result inconsistent with other study in Nigeria^[15]. A history of upper respiratory tract infection or gastroenteritis (62.3 and 26.2) % respectively was reported to proceed the majority of cases of AFP The result showed no significant differences between the sex of patients ($P = 0.69$), This is also consistent with previous literature and may be explained by sex differences in the susceptibility to infectious agents^[16, 17]. The results shows there is no significant difference between residing location and paralysis ($P= 0.085$) which is consistent with findings of a study conducted in Iran^[18].

4. CONCLUSION

1. The majority of AFP cases occurred in children under five years of age, male.
2. Most cases had received at least one dose of polio vaccine.

A significant protective association was identified, with vaccinated individuals less likely to develop AFP.

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