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SPECTRUM OF ACUTE FLACCID PARALYSIS IN CHILDREN

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ABSTRACT

INTRODUCTION

Acute flaccid paralysis (AFP) is a clinical syndrome characterized by rapid onset of weakness in a child aged less than 15 years due to any cause when polio is suspected⁽¹⁾. Exact cause of AFP with its incidence is needed for proper management.

The South East Asian Region (SEAR) contains the largest remaining reservoir of wild polio virus in the world⁽²⁾. The 3 endemic countries are Afghanistan, Pakistan and Nigeria.⁽³⁾ West Africa and other countries like Somalia, Syria, Kenya, Euthipia, Cameroon, Niger and Chad also have various reports of polio⁽⁴⁾. AFP surveillance continues to be a critical component of the World Health Organization (WHO) global polio eradication campaign⁽⁵⁾. WHO estimates a background annual incidence of at least 1 case of AFP per 100,000 populations less than 15 years old, in the absence of wild poliovirus transmission.^(6,7)

Other causes of AFP include Guillain Barre Syndrome (GBS), transverse myelitis, traumatic neuritis, spinal cord compromise (low back trauma, abscesses or tumors), meningitis, encephalitis CVA, myopathies, neuropathies and hypokalemic periodic paralysis⁽⁸⁾. GBS still remains the leading cause of AFP in developed as well as developing countries⁽⁹⁾. The objectives of this review are to describe the incidence and differential diagnosis of potential causes of AFP, including distribution by age and gender.

OBJECTIVE

To determine the spectrum of AFP cases in children.

STUDY DESIGN

Retrospective, observational study.

Place and duration of study: Department of Neurology, Children Hospital & the Institute of Child Health, Lahore from January 2013 to October 2013.

METHODS

Retrospectively, we extracted the data from multi centers of notified AFP cases. Causes of AFP were sorted out with their frequencies. All the patients with lower limb weakness were admitted for workup. Although the initial diagnosis was based upon clinical presentation, few laboratory investigations were carried out on the basis of the clinical picture. Two stool specimens collected ≥ 24 hours apart, both within 14 days of paralysis onset, and shipped on ice or frozen packs to a World Health Organization-accredited laboratory, arriving in good condition, as per guidelines given under National Polio surveillance project⁽¹⁰⁾. All the stool samples were sent to virology laboratory at National Institute of Health Islamabad for isolation of polio virus.

Serum electrolytes, Cerebrospinal fluid examination, Magnetic resonance imaging (MRI) of brain or spine and electrophysiological studies were carried out in certain cases when it was required or diagnosis was doubtful. The final diagnosis was based on the available clinical data, vaccination history and epidemiologic data of the province and laboratory results.

RESULTS

Out of 376 cases of AFP, there was male predominance 59.57% (n=224) with male to female ratio 1.5:1 (age ranged 11-18 years) demonstrated in figure 1 and 2. Highest no. of patients fell in other categories (23.9%) including neuropathy, myopathy, spinal muscular atrophy, sepsis and tuberculosis spine, followed by GBS (18.88%), traumatic neuritis (12.76%), hypokalemic hypotonia (9.30%), CNS infection (3.45%) and transverse myelitis (1.68%). Illnesses which present with lesser frequency includes spinal muscular atrophy, cerebral palsy, cellulitis (0.53%) and rickets (0.26%) (Table 1). Wild polio cases declined because of intensive oral polio vaccine immunization and were found to be 1.59% (n=6) in 6 districts of Punjab having 4 cases in west and each in north and south region. (Table 2)

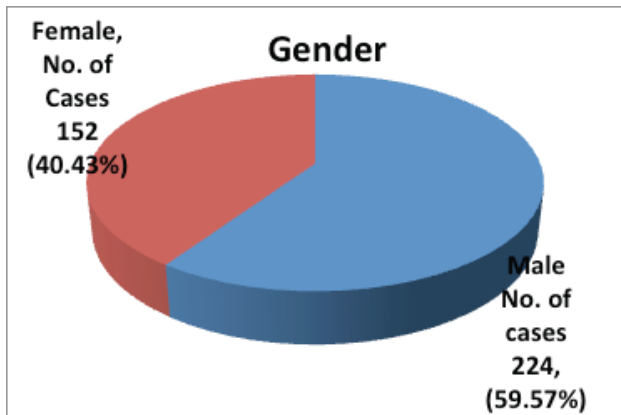


FIGURE 1: A pie chart denoting the gender distribution

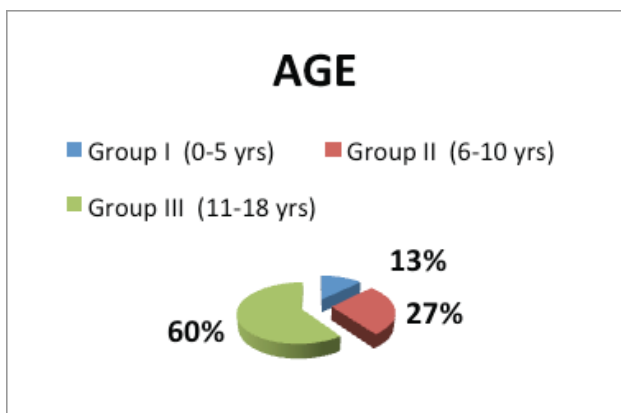


FIGURE 2: A pie chart representing the age distribution in GBS

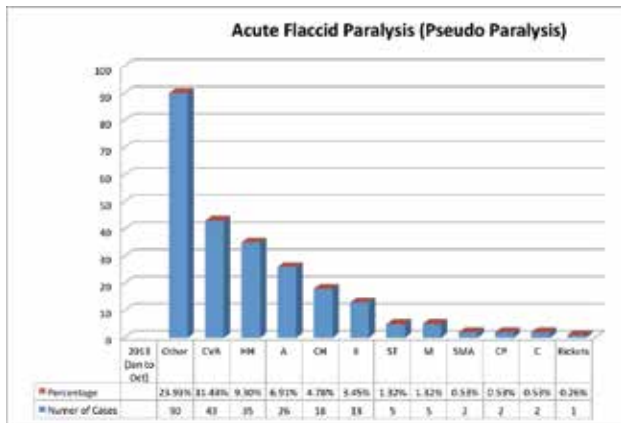


TABLE 1 A bar diagram showing cases of pseudoparalysis

CVA=cerebrovascular accident, **HH**=hypokalemic hypotonia, **A**=arthristis, **CH**=childhood hemiplegia, **E**=encephalitis, **ST**=spinal trauma, **M**=myositis, **SMA**=spinal muscular atrophy, **CP**=cerebral palsy, **C**=cellulitis

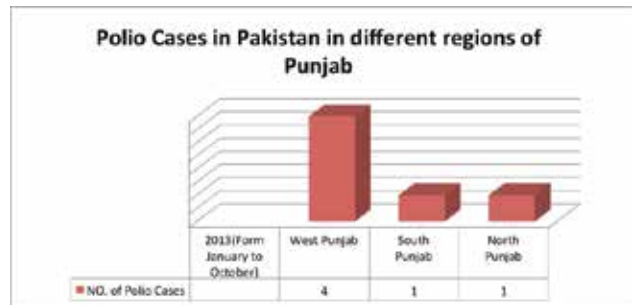


TABLE 2 A bar diagram showing cases of Polio in Pakistan(in Punjab)

DISCUSSION: Active surveillance of AFP in children less than 15 years old plays a pivotal role in monitoring suspected cases of paralytic poliomyelitis and provides evidence for the elimination of indigenous wild poliovirus. In 2012, the annual national Non-polio AFP rate in Pakistan (per 100,000 population aged <15 years) was 6.3 (range among the six provinces/territories: 2.4–9.1) which is high⁽¹⁰⁾. In the present study, 6 cases of wild polio virus or vaccine associated polio virus were isolated. GBS is one of the important causes of AFP. This has been highlighted by the previous studies where incidence of GBS leading to AFP has ranged from 47.3-72.2%^(8,11,12). T S Saraswathy et al conducted a study in Malaysia. where GBS was 32.2 %⁽¹³⁾. A study carried out by Jasem et al in Iraqi children identified GBS as a common cause accounting to be 52 %⁽¹⁴⁾. In another study, conducted in Sindh by Memon I A et al⁽¹⁵⁾, the most common cause of non-polio AFP identified in the series was GBS (21%).

In our study, GBS was found to be (18.88%), the most common cause of non-polio virus AFP excluding the causes of pseudoparalysis (Table 3).

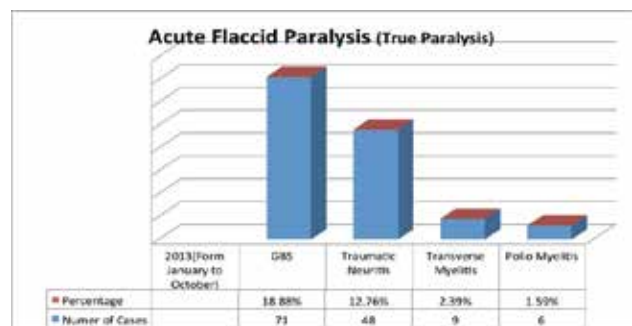


TABLE 3 A bar diagram showing causes of True Paralysis

In a study done by D'Souza et al⁽¹⁶⁾ in Australia, 19% had transverse myelitis. In another study by Narang G S et al⁽⁹⁾, only 5.9% of children were diagnosed with

transverse myelitis as compared to our study where (1.68%) of children had transverse myelitis. In some studies, GBS was followed by viral myositis while in others by hypokalemic paralysis.^(9,17) In our study, traumatic neuritis was the most common cause of non-polio AFP after GBS (Table 3). The likely explanation for the difference in pattern may be due to more prevalent viral infections, decreased immunity in our malnourished children, incomplete vaccination, intramuscular injections and tuberculosis. There is male predominance as seen in other studies conducted in South East Asian region.^(9,14) (Figure 1). Age group varies in different areas of the region having preschool children affected in Sindh, Pakistan⁽¹⁵⁾ while school children in our study and also in a study from Amritsar, India⁽⁹⁾. (Figure 2)

CONCLUSION

Non polio cases of AFP are more than Polio. The study confirms GBS as the most common cause of AFP in the <15 years population of Punjab. The reporting of cases having pseudoparalysis is quite high. For global eradication of poliovirus (PV), Pakistan should remain vigilant for effective surveillance of Polio and non-polio cases

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Author's contribution:

Shaila Ali; Study concept and design, protocol writing, data collection, data analysis, manuscript writing, manuscript review

Zia ur Rehman; Study concept and design, data collection, data analysis, manuscript writing, manuscript review

Tipu Sultan; Study concept and design, data collection, data analysis, manuscript writing, manuscript review