JRMI
Journal of Rehman Medical Institute

Volume 8, No. 3
July - September 2022
www.jrmi.pk

ORIGINAL ARTICLE

Traumatic Injection Neuropathy in children presenting with acute flaccid paralysis at a tertiary care hospital of Peshawar

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Submitted
August 12, 2022
Accepted
September 15, 2022

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Citation: Shah MA, Ahad A, Ullah M, Rehman SU, Bibi R, Muhammad N. Traumatic Injection Neuropathy in children presenting with acute flaccid paralysis at a tertiary care hospital of Peshawar. J Rehman Med Inst. 2022 Jul-Sep;8(3):14-6.

ABSTRACT

Introduction: Acute Flaccid Paralysis (AFP) is the acute onset of focal weakness or flaccid paralysis without obvious cause, such as trauma, in children less than 15 years old. Pakistan is endemic for polio and any case of AFP raises alarms regarding polio infection. High and variable rates of traumatic injection neuropathy are reported in the literature among children who present with AFP, a finding that is applicable to our settings.

Objective: To determine the magnitude of traumatic injection neuropathy among children presenting with acute flaccid paralysis at a tertiary care hospital of Peshawar.

Materials & Methods: This cross sectional study was carried out at Pediatric Department, Hayatabad Medical Complex, Peshawar from January 27, 2020 to July 27, 2020, during which time 193 patients of Acute Flaccid Paralysis were observed after getting informed consent. A detailed history was obtained and clinical examination conducted to identify the cause of AFP. Data were recorded on a designed Performa and analyzed in SPSS 22 for descriptive statistics.

Results: Of 193 children, 72% children were in age range 1-7 years while 28% were in age range 8-15 years; 110(57%) children were male and 83(43%) children were female. Moreover 17(9%) children had Traumatic Injection Neuropathy (TIN), of whom 13(76.5%) were from the rural areas.

Conclusion: Despite misgivings, the magnitude of Traumatic Injection Neuropathy in children with Acute Flaccid Paralysis was within the figures reported by international literature; however, there should be concerted attempts to decrease this figure further, particularly in the rural areas.

Keywords: Injections, Intramuscular; Poliomyelitis; Flaccid Paralysis; Traumatic Injection Neuropathy.

The authors declared no conflict of interest. All authors contributed substantially to the planning of research, data collection, data analysis, and write-up of the article, and agreed to be accountable for all aspects of the work.

INTRODUCTION

Acute Flaccid Paralysis (AFP) was defined by the Canadian Pediatric Society as acute onset of focal weakness or flaccid paralysis without other obvious cause, such as trauma, in children less than 15 years old.[1] Medical conditions that fall under the clinical diagnosis of AFP vary from continent to continent.[2]

The World Health Organization (WHO) reported that out of the 8-12 billion injections administered worldwide annually, the vast majority (90-95%) were for therapeutic purposes, 50% are unsafe, and 75% are unnecessary. Injection administration is seen as one of the most common healthcare procedures, and unsafe injections are associated with morbidity and mortality, especially in developing countries.[3] Traumatic Injection Neuropathy (TIN) can occur because of unsafe intramuscular injection practices. TIN involving the sciatic and radial nerves presents as acute peripheral neuropathy with flaccid paralysis of the injected limb within 24 hours after injection and is associated with pain and hypothermia in the affected limbs.[4]

This complication is of particular concern in countries with high rates of unnecessary injections.[5] While some data exist regarding the medical complications of these injections, no estimate has been published regarding the disease burden caused directly by injection trauma.[6] Affected individuals usually present with foot drop and this can result in varying degrees of motor disability depending on the timing and duration of corrective measures instituted.[7] The reported prevalence of TIN among children presenting with AFP is 40.9%,[7] 7.4%,[8] and 72%[9].

The idea behind doing this study came into our mind after thorough literature search and observing that TIN is a global problem particularly in resource poor countries. Moreover, as we know that Pakistan is an endemic country for polio and any case of AFP raises alarms regarding the polio infection.

However, the literature suggested very high and variable rates of TIN among same children who present with AFP which is also applicable to our settings.

Data regarding TIN is extremely rare and therefore, we are conducting this study to generate local statistics about the TIN among patients who present with AFP.

MATERIALS & METHODS

This cross sectional study was carried out at Department of Pediatrics, Hayatabad Medical Complex, Peshawar over 6 months (January 27, 2020, to July 27, 2020). Inclusion criteria were all children presenting with acute flaccid paralysis within 48 hours, age 1-15 years, and either gender.

Exclusion criteria were all the children with already diagnosed cases of Poliomyelitis on history and medical records, and / or history of trauma / accident involving spine.

All children fulfilling the inclusion criteria were invited to participate in the study through OPD and Pediatric Department, Hayatabad Medical Complex, Peshawar**.** The purpose and benefits of the study was explained to all parents and written informed consent was obtained.

All patients were subjected to detailed history and clinical examination as per criteria mentioned above. All data were recorded on a specifically designed Performa. Exclusion criteria were strictly followed to control confounders and avoid bias in the study results.

Collected data were entered in statistical software SPSS version 22 and descriptive analysis was performed. Mean and standard deviation was computed for numerical variables i.e. age, and duration of disease. Frequencies and percentages were computed for categorical variables.

RESULTS

Among 193 mothers, 139(72%) children were in age range 1-7 years while 54(28%) children were in age range 8-15 years. Mean age was 30 years with SD ± 7.38. Gender of the baby was analyzed as 110(57%) children were male and 83(43%) children were female. Traumatic injection neuropathy was analyzed as 17(9%) children had traumatic injection neuropathy while 176(91%) children did not have traumatic injection neuropathy (Table 1). Duration of disease was analyzed as 162(84%) children had duration of disease ≤1 month and 31(16%) children had duration of disease >1 month. Mean duration of disease was 1 weeks with SD ± 2.11. Location was analyzed as 156(81%) children were from rural areas and 37(19%) children were from urban areas. Affected limb was analyzed as 41(21%) had right lower limb affected, 98(51%) had left lower limb affected, 19(10%) had right upper limb affected, 35(18%) had left upper limb affected. Muscle groups affected was analyzed as 131(68%) children had proximal muscle affected, 29(15%) children had distal muscle affected, 33(17%) children had both proximal and distal muscle affected (Table 1).

Table-1: Characteristics of Traumatic Injection Neuropathy in children (n=193).

Traumatic Injection Neuropathy	Frequency	Percentage
Present		
Yes	17	09
No	176	91
Duration of disease		
≤ 1 month (n =162)	14	82.35
> 1 month (n = 31)	03	17.65
Referral		
Rural (n = 156)	13	76.50
Urban (n = 37)	04	24.50
Muscle Groups Affected		
Proximal (n = 131)	12	70.60
Distal (n = 29)	02	11.75
Both (n = 33)	03	17.65

DISCUSSION

Our study shows that among 193 mother 72% children were in age range 1-7 years while 28% children were in age range 8-15 years. 110(57%) children were male and 83(43%) children were female. 162(84%) children had duration of disease ≤1 month and 31(16%) children had duration of disease >1 month. 156(81%) children were from rural areas and 37(19%) children were from urban areas. 149(77%) father were unskilled while 44(23%) father were skilled. 41(21%) had right lower limb affected, 98(51%) had left lower limb affected, 19(10%) had right upper limb affected, 35(18%) had left upper limb affected. 131(68%) children had proximal muscle affected, 29(15%) children had distal muscle affected, 33(17%) children had both proximal and distal muscle affected. 17(9%) children had traumatic injection neuropathy while 176(91%) children didn't had traumatic injection neuropathy.

In another study, Khan M, et al[7] had reported that in a total of 193 cases 112(58%) were male and 81(42%) were female. The age ranged from 1 year to 14 years (mean age 3.7±3 years). The commonest diagnosis was injection neuritis which was 79 cases (40.9%), followed by non-polio (NP) 42(21.8%).

In another study carried out by Mansoor F et al[8] had reported that of the 5627 AFP cases reported in Pakistan in the years 2001–03, 515 were potential TIN cases. After the complete record review, 417 cases were classified as confirmed TIN and 39 probable. There was no significant difference between confirmed and probable cases with regard to age, sex or clinical presentation. The median age of confirmed and probable cases was 22 months (range 2–161 months) and 75% of cases were less than 36 months old. Residual paralysis 60 days after the onset of paralysis was

more common in children below 1 year of age than in older children (37% versus 26%, OR = 1.6, P =0.026). The lower limb was involved in 91% of cases, with right and left sides equally affected. Of the children, 72% were reported to have fever at the start of their illness. TIN cases were more common in boys than girls (62% versus 38%, OR = 1.5, P < 0.0001). Of the cases, 75% had received 5 or more doses of oral polio vaccine (median 7 doses) and only 33 (7%) had a confirmed history of polio in the community in the last 60 days.

In another study carried out by Hamzat TK et al,[9] it was reported that in a total of 757 Pediatrics cases 132 (17.4 %) were AFP case, with mean age of 44.31+ 33.03 months and a 1.2:1.0 male: female ratio. Sciatic nerve palsy accounted for majority (72.0 %) of the AFP; only 43.2 % of the patients had completed immunization before the onset; majority of the cases (78.8 %) were referred to physiotherapy within 6 months of onset and the discharge pattern revealed that only 9.8 % of the patients were formally discharged. With injection palsy accounting for majority of the AFP cases, the need for caution in administration of intramuscular injections at the buttocks of children with febrile illnesses is suggested. Importance of adequate documentation of clinical information by clinicians is also emphasized.

A similar study was conducted in Khyber Pakhtunkhwa by Sher Bahadur et al[10] reported a total of 1217 children between the ages of 13 and 24 months (2 years) were included in the study. The majority of the children had a history of fever (65.9%) and asymmetrical weakness 809 (66.5%). The most common cause of AFP was Traumatic Injection Neuritis (TIN), which accounted for 266 cases (21.9%), while in our study it was reported to be 9%.

In our study traumatic injection neuritis was reported as 9% while in Yemen, 788 people were diagnosed with traumatic injection neuropathy over a period of six years, according to a study.[5] Males made up 529(67.1%) and females made up 259(32.9%) of the total. The patients' ages ranged from 1 to 15, with the majority of them being young children under the age of 5, with 555(70.4%) being under the age of 5 and 233 (29.5%) being between the ages of 5 and 15 years; 354(44.9%) patients suffered residual paralysis, according to the results. Within 60 days of follow-up, 429(54.4%) TIN patients improved, 03(0.4%) patients were lost, and 02(0.3%) patient died.

LIMITATIONS

A single-centered study with limited data and attendants who were reluctant to explain intramuscular injections for their child's illness.

CONCLUSION

Considering that Pakistan is a developing nation with an ongoing massive polio eradication program, the magnitude of Traumatic Injection Neuropathy in children presenting with Acute Flaccid Paralysis was well within the figures quoted in the international literature.

RECOMMENDATION

Traumatic injection neuropathy is more common in patients presenting from rural areas probably due to intramuscular injections given by untrained practitioners; such practice should strictly be banned and If needed should be given by skilled practitioners.

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