

# An Outcome of Acute Flaccid Paralysis Surveillance in Khyber Pakhtunkhwa During 2015

Sher Bahadur<sup>1</sup>, Gohar Rehman<sup>1</sup>, Rizwan Anwar<sup>1</sup>, Attaullah Jan<sup>1</sup>, Shams ur Rehman<sup>1</sup>,  
Shehnaz Bakhtiar<sup>2</sup> and Shaista Rasool<sup>1</sup>

## ABSTRACT

**Objective:** The present study aims to determine the final outcome (diagnosis) of AFP cases reported in Khyber Pakhtunkhwa (KP).

**Study Design:** Descriptive study

**Place and Duration of Study:** This study was conducted at Health Department with Joint Collaboration World Health Organization from January 2015 to January 2016.

**Materials and Methods:** This study was based on evaluation of secondary data related to APF surveillance data. Formal permission was taken from Provincial Polio Surveillance Unit, health department KP, data was received in MS Excel sheet which was transformed into SPSS version 20 for analysis.

**Results:** A total of 1217 cases with mean age of  $42 \pm 34.2$  (ranged 1 to 172 months) out of whom 724 (59.5%) were being male and 493 (40.5%) were being female. The children with age range of 13-24 months (2 years) were high in proportion. Most of the children presented with history of fever 802 (65.9%) and asymmetrical weakness 809 (66.5%). Traumatic Injection Neuritis (TIN) was the leading cause of AFP accounted for 266(21.9%), followed by GBS 214(17.6%), Unspecified fall 190(15.6%), Arthritis 54(4.4%) and Meningitis 33(2.7%) respectively. There was no single case of true poliomyelitis although 27(2.2%) cases were suspected during initial health assessment. Apart from these etiologies, there were 55 other clinical conditions associated with AFP.

**Conclusion:** Traumatic injection neuritis and GuillainBarre Syndrome misleading the causes of AFP in the region among children. Unspecified Injuries/trauma and fall plays a significant role in disability among children and account for overuse of hospital services.

**Keywords:** Traumatic injection neuritis, GuillainBarre syndrome, Arthritis, poliomyelitis and Meningitis

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## INTRODUCTION

Poliomyelitis is an acute viral infection which ranges in severity from a nonspecific illness to paralysis with permanent disability. It is one of the diseases which is incurable but can be prevented. Polio virus when invades the nervous system through blood stream, causes Acute Flaccid Paralysis (AFP) rendering the person crippled for life.<sup>1</sup>

The global effort to eradicate polio has become the largest public health initiative in history and is spearheaded by the World Health Organization (WHO).<sup>2,3</sup> Polio cases (limited number) are now pertinent to few countries that can be eradicated. Targeting and eradication of polio case is easy because polio only

affects humans, and an effective, inexpensive vaccine is available which provides lifelong immunity<sup>4</sup> There are no long-term carriers of the disease, no animal or insect reservoir and the virus can only survive for a short time in the environment.<sup>5</sup>

Pakistan has been the major contributor to confirm polio cases in 2013 as compared to Nigeria and Afghanistan the only three remaining endemic countries<sup>6-8</sup>. The polio eradication campaigns in Pakistan has been suffering from continuous setbacks as 27 polio workers have been assassinated since December 2012 during anti-polio immunization campaigns<sup>9,10</sup>. According to the 2013 World Health Organization report, 74 polio cases have been reported in Pakistan. However, 51 (69%) of the polio confirmed cases are from Federally Administered Tribal Areas (FATA), identifying it as the single major poliovirus reservoir in Pakistan<sup>6,8</sup>. The Government of Pakistan has highlighted multiple reasons for the growing polio endemic in Pakistan citing primarily militancy and 'refusal families'. Militancy, especially in the Federally Administered Tribal Authority (FATA) and North Waziristan areas of Pakistan, may have compounded the polio campaign further by putting many children at risk.

<sup>1</sup>. Department of Health Policy and Management / Pathology<sup>2</sup>, Khyber Institute of Child Health Peshawar.

Correspondence: Sher Bahadur, Epidemiologist, Department of Health Policy and Management, Khyber Institute of Child Health Peshawar.

Contact No: 03453018449

Email: sher.umar@yahoo.com

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World Health Organization has been involved in many activities for Polio eradication which include capacity building, supporting public health emergencies and strengthening the integrated polio surveillance.

Screening of polio cases requires extensive follow up of 60 days after the onset of sign and symptom, which account for significant among of resources (human and financial) unity <sup>2</sup>screening involves activities like differentiating cases of AFP caused by Polio virus from those that are caused by other factors such as GuillainBarre syndrome, Transverse myelitis, Non-polio enteromyelitis, Traumatic/injection neuritis, Childhood hemiplegia, CVA, Encephalitis, Meningitis etc puts a toll on the already overburdened health infrastructure/resources respectively.<sup>11-14</sup> the purpose of such screening was to exclude the miss leading (non-polio viral)cause Acute Flaccid Paralysis. hencea major chunk of resources of polio eradication are spend on scrutinization of theses diseases.

In our view, the ambition of the global health community to eradicate polio appears to be blinding it to the lessons learnt about health systems over the past 30 years. Polio eradication will only be achieved with stronger health systems and bottom-up community engagement, which is likely to require more time and more investment than is currently available in Pakistan, Nigeria, and Afghanistan because of their political fragility.

The solution is to strengthen the routine health system, including door-to-door general vaccination coverage rather than highlighting polio as “the only” health problem an important solution that has been acknowledged in the Polio Eradication and Endgame Strategic Plan 2013–18<sup>15 16</sup>. However, the time lag needed to put this solution into practice may be problematic. Although new opportunities often arise to integrate polio eradication activities into other immunization campaigns, policy implementers frequently fail to take advantage of such opportunities. For example, during the recent measles outbreaks in Pakistan<sup>17</sup>, polio vaccine could have been administered to millions of children in the affected districts but, as a routine practice, immunization campaigns were limited to vaccination against measles.

The strong health system may be able to minimize other causes of AFP. However weak health management is found as the hub of majority of the challenges<sup>18</sup>.

**MATERIALS AND METHODS**

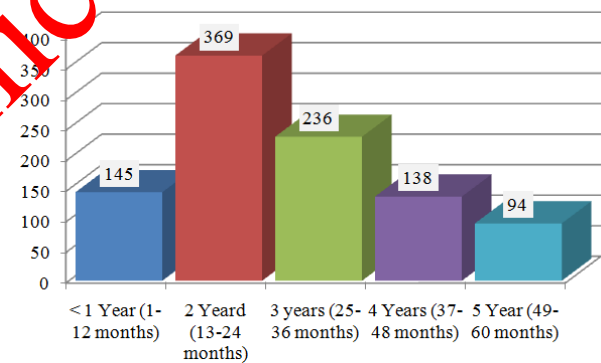
A retrospective descriptive approach was conducted which was based on the secondary AFP surveillance data of Khyber Pakhtunkhwa for the period of year, (Jan-2015 to Jan-2016) at the health department with joint collaboration World Health Organization, where all clinical and laboratory data for all reported cases of AFP is available. There are 1218 case of AFP reported from different areas of Khyber Pakhtunkhwa through

active and passive (zero reporting) surveillance methods during 2015. All cases reported in the above mentioned period, regardless of sex, ethnicity and area of belonging were included in the study.After formal permission from Provincial Polio Surveillance Unit (under Provincial Extended Program) and chairman Expert Review Committee (ERC)was obtained. The data was then filtered according to the objective of the study. The data was analyzed using SPSS 20 and results were subjected for appropriate statistical analysis.

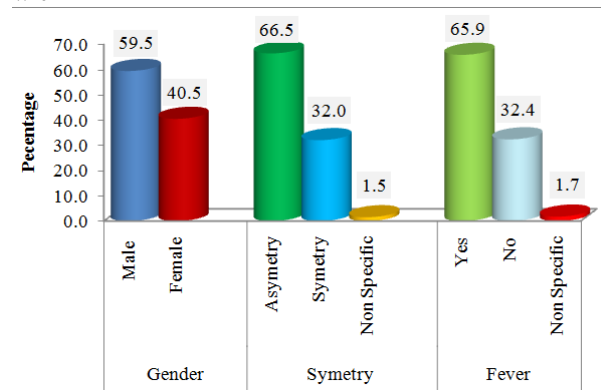
**RESULTS**

A total of 1217 cases were reported to the health department from 01-Jan-2015 to 30-Jan-2016. Out of those 493 (40.5%) were female and 724 (59.5%) were male with mean age of 42 ± 34.2 (ranged 1 to 172 moths). Result indicate that 369(30.3%) of the effected children were of 2 years (ranged 1-12 months) of age and 3 years (ranged 25-36 months) of age as shown in figure 1.

Regarding the involvement of the body in AFP, 809 (66.5%) were asymmetrical (single side involvement) while 390 (32.0%) had weakness in both side of the body and 18 (1.5%) were unable to correlated the weakness. Fever was reported by 802 (65.9%) of the children (table 2).



**Figure No.1: Age categories of children presented with AFP in KP**



**Figure No.2: Gender and basic of sign and symptoms of AFP cases in KP**

Injection neuritis remained the leading cause of AFP among the children followed by GuillainBarre Syndrome (GBS) respectively. Unclassified/unnoticed trauma was the third leading cause followed by Arthritis and Meningitis as shown in table 1. Where the least frequent diagnosis which included (arranged in descending order based on frequency) Electrolytes

Imbalance, Rickets, Diphtheria Neuropathy, Malnutrition, Pneumonia, Metabolic Disorder, Gastrointitis, Cerebral Palsy, Muscular Dystrophy, Monoperisis, Degenerative Disease, Epilepsy Seizure, Tubercullus Meningitis, Rheumatic Fevel, Post Chicken pox weakness, Opium Poisoning, Multiple Salvosis and Hydrocephalus.

**Table No.1.Comparison of provisional andfinal diagnosis of AFP cases in Khyber Pakhtunkhwa**

Provisional Diagnosis based on DRC			Final Diagnosis based ERC		
Diagnosis	F	%	Diagnoses	F	%
Injection Neuritis	298	24.5	T80: Traumatic/Injection neuritis	266	21.9
GBS	266	21.9	G61.0: GBS	214	17.6
Unnoticed Trauma	139	11.4	Unclassified	212	17.4
CVA	77	6.3	W19: Unspecified fall	190	15.6
Arthritis	73	6.0	M13: Arthritis	54	4.4
Trauma	62	5.1	G03: Meningitis	33	2.7
AFP	43	3.5	G81: Hemiplegia, hemiparesis	29	2.4
Meningitis	37	3.0	E87.6: Hypokalemic hypotonia	26	2.1
Suspected Poliomyelitis	27	2.2	G04: encephalomyelitis	23	1.9
Acute Ataxia	26	2.1	B34.1: Non-polio enterovirus	16	1.3
Synovitis	25	2.1	R27.0: Ataxia, Cerebellar	16	1.3
Encephalitis	20	1.6	Other	15	1.2
Hypocalemia	19	1.6	G93: CVA	15	1.2
Febrile Fits	15	1.2	A17+:Tuberculosis	09	0.7
Myopathy/Myositis	12	1.0	R56: Febrile Seizure, Fit	08	0.7
Pseudo Paralysis	10	0.8	M65: Synovitis and tenosynovitis	06	0.5
Non Polio Neuropathy	10	0.8	E87: fluid electrolyte imbalance	05	0.4
Electrolytes Imbalance	07	0.6	E88: Metabolic disorders	05	0.4
Rickets	06	0.5	G7: Disorders of muscle	05	0.4
Diphtheric Neuropathy	06	0.5	G83: Monoplegia,	05	0.4

## DISCUSSION

Acute flaccid paralysis (AFP) is a clinical condition associated with complex characteristics including weakness in legs, muscles and swallowing, progressing to maximum severity within several days where the term "flaccid" means the absence of spasticity (hyperreflexia of) extensor of in motor tract of central nervous system (CNS).<sup>5</sup> The cause of AFP is associated with variety of provoking factors like infections, injection neuritis, GBS and arthritis etc.<sup>20</sup>

In Pakistan suspected AFP cases are reported to the surveillance system of the poliomyelitis eradication initiative. The data indicates that 1218 cases of AFP were evaluated for final diagnosis in 2015.

Based on the ERC data, out of total AFP cases traumatic injection neuritis accounted for 266(21.9%), followed by GBS214 (17.6%) respectively.

The prevalence of injection neuritis is 7.1 per 100000 in children under 3 years old.<sup>21</sup> While in present study the 21.9% of children with AFP were diagnosed with injection neuritis. This indicates that incidence of injection neuritis is high in PKP. However literature supports this study regarding incidence of GBS.

According to study in District Bannu which indicates that the leading etiology of AFP was GBS contributed to 15% of AFP cases.<sup>22</sup>

The incidence of injection neuritis is common because the treatment of choice for treatment of all types of fevers is the use of injections. Therefore it is recommended that if cases of poliomyelitis are not to be missed, the diagnosis of injection trauma or traumatic neuritis (TN) must be exact.<sup>14</sup> Unspecified fall accounted for 190(15.6%) of the reported cases which indicate that trauma is the leading cause of weakness of lower motor neuron which is one of characteristic feature of AFP. According to ICD report 10% of hospital admissions among children take place due to unspecified fall.<sup>23</sup> This indicates proportion of this condition is high in Khyber Pakhtunkhwa. Other leading causes include; M13 (Arthritis) G03 (Meningitis), G81 (Hemiplegia, hemiparesis), E87.6 (Hypokalemic hypotonia) and G04 (encephalomyelitis) etc. Literatures conclude that there are multiple causes of AFP varying from region to region ranging from infection both bacterial and viral to injuries (traumas) and auto immune diseases. The potential possible causes reported by literatures are; infections both viral

and bacterial like Poliomyelitis, Non polio enterovirus, Neurotropic Viruses (Encephalitis virus etc.). Guillain-Barré syndrome (GBS), Acute TIN, Acute Transverse Myelitis (TM), Neuropathies (Exo-toxin of *Corynebacterium Diphtheria*, toxin of *Clostridium Botulinum*, tick bite paralysis etc.), Diseases of the Neuromuscular junction (myasthenia gravis etc.)<sup>20,22</sup> Disorders of muscle like polymyositis, viral myositis and metabolic disorders (hypokalemic periodic paralysis) etc. The result of the present study reveals the same as shown in table 1.

## CONCLUSION

Among the non viral cause of AFP, traumatic injection neuritis and Guillain-Barre Syndrome remained on the top of the list. Unspecified trauma and falls also has significant contributions to AFP and disability among children. Quackery practices in Pakistan need to be banned. Need a proper awareness among medical professionals and parents about the risk of intramuscular injections among children. Further study is required to investigate causes of false positive cases.

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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