# STUDY OF PATIENTS PRESENTING WITH ACUTE FLACID PARALYSIS IN DERA ISMAIL KHAN, NWFP - PAKISTAN

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*A descriptive study was designed to analyse patients of acute flacid paralysis (AFP) in paediatric deptt of DHQ teaching hospital D. I. Khan during 2002. A total of 36 cases of AFP were reported during this period. They were clinically examined. History was taken with special reference to IM injection and OP vaccination. Stool samples were sent to NIH Islamabad for viral detection. Out of total of 36 patients, 15 were confirmed as polio, 5 were labelled as compatible with polio and 16 were non-polio cases. Out of 15 confirmed cases of polio, 12 (80%) had received IM injections and all had some residual paralysis / weekness after two months follow-up, while 3 of the non polio cases had received I.M. injections and non had residual paralysis / weekness on follow-up. Main cause of high polio prevalence seems to be due to low vaccination rate, particularly routine as compared to supplemental vaccination. It was concluded that supplemental polio vaccination should be continued in an improved and strengthened fession through NIDs and EPI.*

***Keywords:*** *Acute poliomyelitis, IM injections, OP vaccination.*

## INTRODUCTION

In May 1988, World Health Assembly (WHA) committed World Health Organization (WHO) to the global eradication of poliomyelitis by the year 2000 vide its resolution WHA 41.29[1]. However this target could not be achieved because of multiple reasons but massive world wide efforts, including widespread use of Oral Polio Vaccine (OPV) routinely through Expanded Program on Immunization (EPI) and via National Immunization Days (NIDs), have led to substantial progress towards achieving this goal[2]. When WHO launched its campaign to wipe out polio in 1988, the disease affected more than 120 countries, it is now endemic in only six countries (India, Pakistan, Nigeria, Afghanistan, Niger and Egypt[2,3]. The number of cases reported worldwide has decreased from about350,000 in 1988 to 682 in 2003[4]. But recent outbreaks in 2004 in central and western Africa originating from Nigeria and in 2005 in Yaman, have made the situation more grave[5].

In Pakistan, although confirmed cases of polio are still occurring but progress towards eradication is good. In 1999, 328 confirmed cases were reported, while this number was decreased to 103 in 2003, to 53 in 2004 and to only 6 cases up to June 2005[6].

There was a small outbreak of AFP / Acute Poliomyelitis in Dera Ismail Khan District during the year 2002 with 36 cases as compared to only 4-5 expected. Analysis of this outbreak is presented in this paper.

## MATERIAL AND METHODS

This is a descriptive study analyzing the case files without controls. The inclusion criterion was acute paralysis / weakness of less than one month duration in patients of less than 15 years of age, with no past history of any gross neurological deficit. The cases were studied for age, sex, geographical distribution, etiology, season of the year, intra-muscular (IM) injections, doses of oral polio vaccine (OPV) received (routine and supplemental), case detection rate, stool adequacy rate and other AFP surveillance indicators.

After initial scrutiny for acute flaccid paralysis (AFP), patients were admitted in hospital. One to two (1-2) stool samples were collected with an interval of 24-48 hrs. These samples were sent to National Institute of Health (NIH) Laboratory, Islamabad via courier service with a reverse cold chain. Stool samples were cultured for polio and other viruses and results were available within 4-6 weeks.

Patients were managed conservatively with supportive measures and sent home when stable. They were called back after 60-75 days for follow up and for detection of residual paralysis, if any.

Patients were classified as confirmed polio, compatible with polio or discarded according to Polio Eradication Initiative (PEI) guidelines.

**Statistical Method**
Descriptive statistical method is applied.

## RESULTS

A total of 36 cases of AFP were reported during 2002 as compared to the expected figure of ≥ 4. Out of these, 15 (41.6%) were confirmed polio cases by positive stool culture for polio virus 1, 5 (13.8%) were compatible with polio as per PEI classification and 16 (44.6%) were discarded as non polio. The diagnoses of the discarded cases were Guillaine-Barre syndrome in 6, enteroviral neuropathy in 7 and unknown in 3 patients.

More than half of the patients were below 2 years of age (26, 72%), while 6 patients (17%) were 2-3 years and 4 (11%) were above 3 years of age.

Twenty (55.5%) of the patients were male and 16 (44.5) were female (Table 1).

**Table 1:** *Age / Sex Distribution.*

| Age-Sex | 0-1yr | 1-2yr | 2-3yr | 3yr+ | Total |
|---|---|---|---|---|---|
| Male | 7 | 4 | 3 | 2 | 16 |
| Female | 6 | 9 | 3 | 2 | 20 |
| Total | 13 | 13 | 6 | 4 | 36 |

Majority of the confirmed polio cases were from FR Darazinda area (8 in number), while 6 were from Tehsil D. I. Khan and one from Tehsil Kulachi.

The outbreak peaked during the months of Aug (5 cases reported), Sept (14 cases), Oct (5 cases) and Nov (3 cases). In rest of the months of the year 1-2 cases were reported per month (Fig. 1).

Out of 15 confirmed polio cases, 12 (80%) had received IM injections during their illness and all of them had some residual paralysis / weakness. While in non-polio cases, only 3 (18.7%) had received IM injections and none had residual paralysis / weakness.

Number of OPV doses received by patients was very low and this was the possible cause of outbreak. Only 3 out of 36 had received 3 doses of routine immunization and rest had received 2 or less doses. Only 17 out of 36 had received 3 or more supplemental doses through NIDs. Out of 15 confirmed cases 9 (60%) had received no routine dose of OPV and less than 3 supplemental doses, while 6 (40%) had received 3 or more supplemental doses. Routine vaccination was particularly low with average of 0.44 (0-3) doses per patient while supplemental vaccination through NIDs had better coverage with an average of 3.7 (0-12) doses / patient (Fig. 2).

Case detection rate was 61% (22) in first week, 11% (4) in second week and 28%) (10) after 2 week of onset of paralysis. Hence in this last group stool samples were inadequate, while as a whole stool sample adequacy rate was 72%. This figure is low mainly because of delay in case detection.

## ACTIVITIES

After discussion between District Health Team, EPI staff and WHO staff, following steps and activities were planned to control the out break.

1. FR Darazinda area was planned for repeat mop-up vaccination.
2. A household survey was conducted to assess the vaccination coverage in Tehsil D. I. Khan. Ten Union Councils were found poorly or partially covered, while overall coverage was 88%.

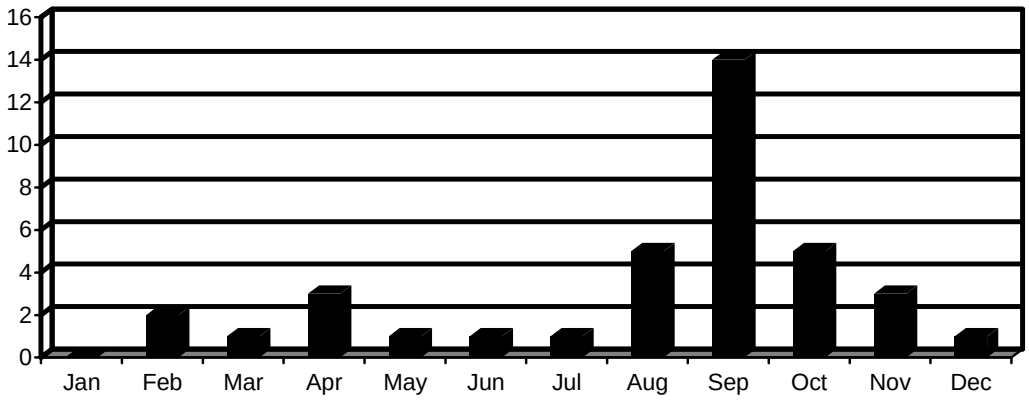


**Fig. 1:** Month Wise Distribution

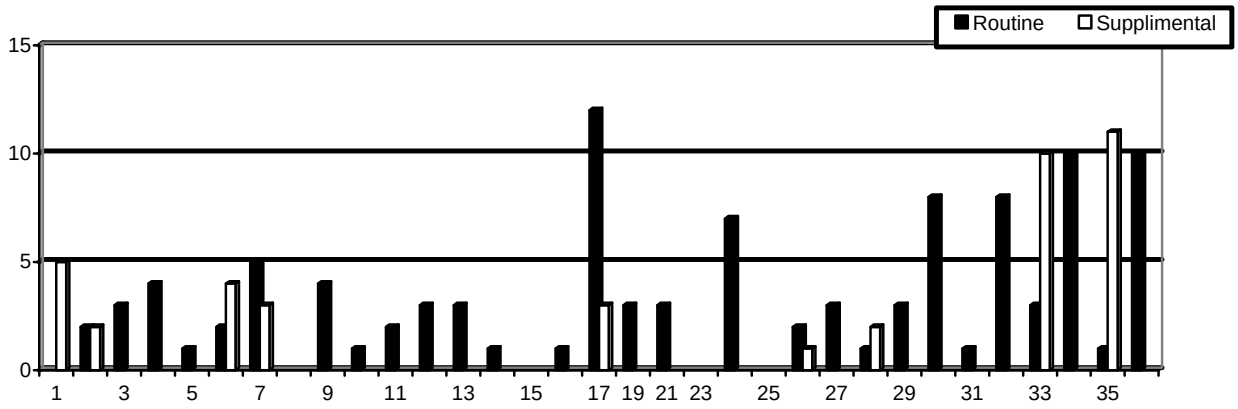


**Fig. 2:** Doses of OPV received

3. The poorly covered Union Councils were revaccinated.

After these above measures AFP cases reduced from 14 in Sept to 5 in Oct and only one in Dec 2002.

In year 2003, 7 AFP cases were reported from the District and all were non-polio, while in 2004, 9 cases were reported and only one was confirmed polio. In 2005, so far 8 cases have been reported and all are non-polio.

## DISCUSSION

Dera Ismail Khan District binds NWFP to Punjab (D. G. Khan and Bhakker districts) and Balochistan (Zhob district) provinces. It is a densely populated district with a total population of about 995,384 during the year 2002 with the < 5 years population of about 169,215.

There is a high proportion of migratory population traveling through this district namely tribal nomads and Afghan nomad. This migratory population is a high risk group as it is hard to assess the vaccination status of their children.

D. I. Khan district has relished without any confirmed polio case in year 2000 and 2001 after last confirmed case in April 2000. But in year 2002 an outbreak occurred with 15 confirmed and 5 compatible polio cases. This was unexpected after more than a year of polio free period. Probable explanation is nomads and very low rate of polio vaccination (WHO report).

All of the confirmed cases were due to P1 virus. This is the commonest type of polio viruses and has been reported in other series as well[7,8].

Eight % of the confirmed polio cases had received some IM injections during their illnesses. This study confirms that IM injections during non paralytic period of acute poliomyelitis can provoke paralysis. This has been reported by other workers as well[2,9,10]. The probable explanation is damage to nerve fibers in muscles by injection needles. Same effect is also produced by strenuous physical exercise, trauma, tonsillectomy etc[9,10]. It is recommended that before world being declared as polio free, one should reasonably be sure that the patient is not suffering from non-paralytic polio before considering IM injection, particularly in children below 5 years of age.

The main cause of this outbreak was under vaccination. This might had been due to failure to vaccinate, vaccine failure, failure to maintain cold chain, faulty technique or probably vaccine not being taken up. In particular, routine vaccination was very deficient. Supplemental vaccination through NIDs was satisfactory. This same situation has also been reported by others11.

This outbreak underscores the importance of continued NIDs because of low rate of routine vaccination and also a need for high quality AFP surveillance. Similarly occurrence of a recent outbreak of polio in northern Nigeria during 2004 and in Yaman during 2005 has resulted in export of wild polio virus (WPV) to 11 countries of western and central Africa[5]. Mopping up campaigns, NIDs and sub-NIDs are now a major focus for the home stretch and door-to-door vaccination, particularly using medical students in some areas[12,13]. This has resulted in a significant increase in vaccination rate[13].

Progress towards interrupting WPV transmission during 2004 in Afghanistan, India and Pakistan, the only three remaining polio endemic countries in Asia, has been satisfactory[14]. The WHO anticipates isolation of last wild polio virus and its interruption by the end of 2005 in these above countries, paving the way for certification of a world free of polio in 2008[14,15].

However the ultimate objective of PEI (discontinuation of OPV) has been jeopardized by

two recent developments: the characterization of vaccine-derived polio virus (VDPV) and renewed concerns over the risk of bio terrorism. The VDPV threat has led the WHO to recommended OPV discontinuation as soon as possible after eradication certification. Therefore OPV cessation needs to be carefully designed to avoid VDPV development. Long term strategies must be designed to guard against the risk of polio re-emergence due to long term VDPV excretors, accidental release of wild virus or bioterrorirm. The main strategies under consideration are surveillance and response approach or a continuation of vaccination with IPV. Choosing between these strategies will pose major dilemma for many countries including India and Pakistan[15].

Poliovirus is a living organism. Man is trying to finish it on earth while it is struggling for its survival. Let us hope man wins the battle.

The **conclusions** and recommendations drawn from the present analysis are:

1. OPV vaccination should be continued through routine EPI as well as through NIDs. Routine EPI needs particular attention, since diversion of all its attention towards polio eradication has resulted in resurgence of other EPI targeted diseases (measles, diphtheria and tetanus in particular) and yet it has failed to eradicate polio.
2. Use of IM injections should be reduced, particularly in children less than 5 years of age especially when acute polio is a possibility.
3. Medical students and other Medical and Para-medical staff may be involved to improve the outcome.

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