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POLIOMYELITIS; ITS STATUS IN SOUTHERN PUNJAB (PAKISTAN) DURING 2003



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ABSTRACT ... drarehman100@hotmail.com **Introduction:** To study the risk factors of polio in Southern Punjab. **Material and methods:** The data of Acute Fluid Paralysis (AFP) cases of year 2003 from the districts of South Punjab notified to the National Surveillance Cell, Islamabad was collected and analyzed. **Results:** Group A consisted of Bahawalnagar, Khanewal, Lodhran, Multan, Muzaffargarh, Pakpattan, Sahiwal and Vehari districts with polio cases while group B consisted of Bahawalpur, Dera Ghazi Khan, Layyah, Rahimyar Khan and Rajanpur districts which were polio free. Total 397 AFP cases with age range of 1-180 months were recorded. Total 17 polio cases (12 confirmed and 5 compatible) were reported with age range of 4-42 months. Total 36 (9.07%) deaths were recorded. Cases recorded with two stool specimens not collected within 14 days of onset of paralysis (24 hours apart) were 19(4.79%). Children who received routine polio doses < 3 or unknown were 193(48.61%) while 150(37.78%) children received < 7 or unknown additional polio doses. Two stool specimens were collected in 380(95.72%) cases. The non-polio enterovirus was isolated from the stool specimens of 92(23.17%) cases while polio vaccine virus was isolated in 15(3.78%) cases. There were significantly greater chances of late notification responsible in the non-collection of two stool specimens within 14 days of onset of paralysis ($p < 0.006$) and under vaccination during routine immunization ($p < 0.0053$) in polio cases. Significantly greater number of polio cases received additional polio doses < 7 or unknown ($p < 0.0001$). The difference in deaths rate in polio and non-polio AFP cases was insignificant ($p = 0.6597$). **Conclusion:** Children remain at risk for polio unless routine immunization is strengthened or additional supplementary immunization is provided as well as timely collection of stool specimens.

Key words: Polio, Non-polio AFP, routine polio immunization, additional polio vaccination, non-polio enterovirus, polio vaccine virus, Polio surveillance.

INTRODUCTION

Since 1988, when the World Health Assembly resolved to eradicate poliomyelitis worldwide, the number of countries in which polio is endemic has decreased from 127 to 6 countries which included Pakistan at the end of 2003¹. Acute Flaccid Paralysis (AFP) surveillance in

Pakistan has met its indicators since 2001².

In 2001 total polio cases in Pakistan were 161 (confirmed 119 and compatible 42) while more than $\frac{3}{4}$ cases of the Punjab occurred in its Southern districts³. In 2002 more than $\frac{3}{4}$ cases⁴ of the Punjab and in 2003

about 50% cases were from Southern Punjab⁵.

The purpose of the study is to know the risk factors of Poliomyelitis in Southern Punjab.

MATERIAL AND METHODS

The data of "any child under 15 years of age with AFP or any person of any age with paralytic illness if polio is suspected" of the districts of Southern Punjab notified to the National Surveillance Cell Islamabad, was collected and was divided in two groups of districts. Group A districts were having confirmed (stool specimen positive for wild poliovirus) and / compatible cases polio (in which diagnosis of polio cannot be excluded) and Group B districts without any case of polio. The data of AFP cases was also divided into two groups. Group C consisted of polio AFP cases while Group D consisted of non-polio AFP cases.

Fisher's exact test was used where needed. P value less than 0.05 was taken as significant. Computers programme "GraphPad Software" available at URL: <http://www.graphpad.com/quickcalcs/contingency1.cfm> was used for statistical calculations.

RESULTS

Group A districts consisted of Bahawalnagar, Khanewal, Lodhran, Multan, Muzaffargarh, Pakpattan, Sahiwal and Vehari while group B districts consisted of Bahawalpur, Dera Ghazi Khan, Layyah, Rahimyar Khan and Rajanpur. Total AFP cases from 13 districts were 397 with age range of 1-180 months. Total polio cases reported were 17(12 confirmed and 5 compatible) with age range of 4-42 months. Table-1 describes and compares different features of AFP cases while table-2 compares polio (group C) with non polio AFP cases (group D).

Table-I. AFP cases in districts with polio and without polio

District group	AFP cases	Deaths	Case with two stool specimen not collected within 14 days of onset of paralysis (24 hrs apart)	Routine polio doses <3 or unknown	Additional polio doses <7 or unknown	Two stool specimen collected	cases with non polio enterovirus isolation from stool	cases with polio vaccine virus isolated from stool
A	243	20 (8.23%)	14(5.76%)	113(46.5%)	98(40.33%)	235(96.71%)	49(20.16%)	13(5.35%)
B	154	16(10.39%)	5(3.25%)	80(51.95%)	52(33.77%)	145(94.16%)	43(27.92%)	2(1.3%)
Total	397	36(9.07%)	19(4.79%)	193(48.61%)	150(37.78%)	380(95.72%)	92(23.17%)	15(3.78%)
P value		0.4776	0.3367	0.3042	0.2034	0.3085	0.0874	0.0557

Table- II. Comparative study of non-polio AFP cases with polio cases

Group	Total cases	Late notification causing two stool specimens not collected within 14 days of onset of paralysis	Routine polio doses unknown or<3	Additional doses <7 or unknown	Deaths
C	17	4 (23.53%)	14 (82.35%)	15 (88.23%)	2(11.76%)
D	380	15(3.94%)	179 (47.10%)	135 (35.53%)	34(8.95%)
P value		0.0060	0.0053	.0001	0.6597

DISCUSSION

This study showed low coverage (51.39%) of routine vaccination in all districts but no factor was detected

which was more common in districts with polio as compared to those without it. During 2000--2001 in Pakistan, reported routine coverage of infants with 3

doses of oral poliovirus vaccine ranged from 33% in Balochistan province to 82% in Punjab² while it was 71% in 2002⁶. Hennessey KA et al⁷ reported that there is over reporting of estimates of vaccine coverage in Pakistan. AFP indicators studied in this study were above target values recommended by WHO⁸.

This study showed that the children with polio were significantly under vaccinated (< 3) through routine immunization as well as more cases received <7 additional doses during National Immunization Days (NIDs). There was significant delay in collection of stool specimens (more than 14 days of onset of paralysis) in polio cases. The reason may be due to the fact that in compatible polio cases diagnosis is mainly clinical, as negative stool culture is not taken to exclude polio and most of the cases reported after 14 days of onset of paralysis. The study done in 1996-97 in Pakistan showed that polio cases were significantly under vaccinated through routine immunization compared with neighbour controls. Although there was no overall difference in NID coverage between polio cases and neighborhood controls, the likelihood of detecting a difference might have been limited, since children were matched by neighborhood⁷. It was noted in the polio endemic districts of India, Uttar Pradesh and Bihar that routine infant vaccination was low although the frequency of supplementary immunization campaign was increased in these areas but could not be substituted for routine vaccination⁹. High routine immunization coverage (>3 doses of OPV) and successful NIDs had been key immunization strategies for eradicating poliomyelitis in many countries¹⁰. The Technical Consultative Group for Poliomyelitis Eradication reaffirms that the four fundamental components of the polio eradication strategy, when fully implemented, will achieve polio eradication. These components include: high levels of routine immunization coverage, NIDs, AFP surveillance, including a WHO-accredited laboratory network and the house-to-house "mop-up" campaigns¹¹. All the first three components were deficient in the studied districts of the Punjab.

All the polio cases were between the ages of 4-42

months in this study. During 1997-1999 in Sialkot the majority of confirmed polio patients were in the age group of 7-12 months¹² while study done in 1996-97 in 7 districts of Pakistan⁷ showed age range 4–54 months. All confirmed polio cases in Rajasthan and 96% cases in India in 1999 were under the age of 5 years while in the year 2000 about 92% of confirmed and compatible polio cases were under 5 years of age¹³.

In conclusion, children remain at risk for polio unless routine immunization is strengthened or additional supplementary immunization is provided as well as timely collection of stool specimens.

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The artist does not see
things
as they are,
but as he is.

Alfred Tonnelle