

POLIOMYELITIS WITH SPECIAL REFERENCE TO IMMUNIZATION STATUS

G.P. Mathur
S. Mathur
V. Gupta
M. Bhalla
J.N. Bhalla
V.N. Tripathi
S.M. Kini
S. Singh

ABSTRACT

One hundred ninety one children below 5 years of age suffering from poliomyelitis were analyzed to find out the immunization status and its correlation with the incidence of poliomyelitis. Effects of age, sex, immunization status and seasonal variation on the morbidity and mortality status were studied. The maximum number of cases were admitted during the months of July (23.6%) and August (23.1%). Of 191 cases, 143 (74.9%) had no immunization and 48 (25.1%) were partially immunized. A total of 155 (81.2%) cases had spinal polio, 23 (12.01%) bulbo-spinal polio, and 13 had (6.8%) bulbar polio. Serious illness (bulbospinal and bulbar type) was more in partially immunized children (25%) as compared to unimmunized children (16.8%). The mortality rate was more than two times higher in the partially immunized (29.6%) as compared to unimmunized children (11.2%). The possible explanation for high mortality in partially immunized children could be due to the adverse effect of OPV which has not been studied so far.

Key words: Poliomyelitis, Oral polio vaccine, Immunization status, Mortality.

Poliomyelitis in tropics is a widespread disease of poor sanitation, crowded areas and lack of immunization, crippling between 0.3-1%(1). It is estimated that in India about 2.24 million children have been handicapped by poliomyelitis and 70,000 newborn children develop the disease every year(2). There have been systemic vaccination programmes under Expanded Programme of Immunization (EPI) initially in 1978 and now under UIP (Universal Immunization Programme) from November, 1985 in an attempt to prevent the disease. The present study was carried out to identify factors (age, sex, immunization status and seasonal factors) which significantly affect the disease morbidity and mortality.

Material and Methods

A total of 191 cases of poliomyelitis in the age group of 0-5 years admitted in the Pediatrics wards of LLR and Associated Hospitals, Kanpur during the period January, 1986 to December, 1988 were studied retrospectively. Children who had received one or two primary doses of OPV vaccine were considered partially immunized and those who had received 3 doses of OPV as fully immunized. Those children more than 1½ years of age who had received three doses of primary immunization plus one booster were considered fully immunized.

The diagnosis of paralytic poliomyelitis was made clinically in cases with flaccid,

From the Department of Pediatrics, G.S.V.M. Medical College, Kanpur 208 002.

Reprint requests: Dr. G.P. Mathur, Professor and Head of Department of Pediatrics, G.S.V.M. Medical College, Kanpur 208 002.

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asymmetrical muscle weakness and sluggish or absent reflexes with intact sensations. Bulbar polio cases were those who had an involvement of the 9th, 10th and 11th cranial nerves manifested as difficulties in speech, deglutination and regurgitation of ingested food matter.

Statistical analysis was performed using the χ^2 test.

Results

A total of 191 children below 5 years were admitted (*Table I*); 155 (81.2%) had spinal, 23 (12.0%) bulbo-spinal and 13 (6.8%) bulbar polio.

One hundred forty three (74.9%) children were totally unimmunized and 48 (25.1%) partially immunized. Of these, one

TABLE I—Age and Sex Distribution in Poliomyelitis

Age (years)	Number (%)	Male	Female	Ratio M : F
< 1	49 (25.6)	33	16	2.0 : 1
1-3	109 (57.1)	78	31	2.4 : 1
3-5	33 (17.3)	22	11	2.1 : 1
Total	191 (100.0)	133 (69.5)	58 (30.5)	2.3 : 1

TABLE II—Immunization Status and its Relation to Recovery

Type of Poliomyelitis	Unimmunized			Partially Immunized		
	Expired No. (%)	Improved No. (%)	Total No. (%)	Expired No. (%)	Improved No. (%)	Total No. (%)
Spinal	8 (6.8)	111 (93.2)	119 (83.2)	6 (16.7)	30 (83.3)	36 (75.0)
Bulbar	4 (40.0)	6 (60.0)	10 (7.0)	3 (100.0)	—	3 (6.2)
Bulbospinal	4 (28.6)	10 (71.4)	14 (9.7)	5 (55.6)	4 (44.4)	9 (18.7)
Total	16 (11.2)	127 (88.8)	143 (100.0)	14 (29.6)	34 (70.4)	48 (100.0)

$\chi^2 = 15.15$;
P < 0.001

$\chi^2 = 13.10$;
P < 0.001.

hundred and twenty seven (88.8%) of the immunized children and 34 (70.4%) of those partially immunized recovered.

Serious type of illness (bulbospinal and bulbar type) was more in partially immunized children (25%) as compared to unimmunized children (16.8%). Death during hospital stay occurred in 16 (11.2%) of the unimmunized and 14 (29.6%) of the partially immunized children (*Table II*).

The maximum number of cases of poliomyelitis admitted were during the months of July (23.6%) and August (23.0%).

Discussion

The annual incidence of polio in India is very high: 2-5/1000 rural and 1-3/1000 urban pre-school children(3). Of 191 cases, 109 (57.1%) belonged to the age group 1-3 years and 25.6% were below the age of 1 year. This is consistent with the findings of Basu *et al.*(3), while Tidke *et al.*(4) observed 73.2% cases between 6 months to 2 years of age. A male preponderance was observed in our study, with male to female ratio being 2.3:1, consistent with the findings of other workers(5,6), possibly because much more priority is paid to a male sib as compared to the under-privileged female sib.

The present study showed a continuing poor immunization status, 74.9% cases being unimmunized, consistent with Tidke's(4) 65.9% and Anand's(5) 83.75% cases being unimmunized.

The infections peaked in the months of July (23.6%) and August (23.0%) with a comparatively raised incidence in April and May earlier than the peak occurrence of viral infections in August, September and October in temperate climates(7).

Sen *et al.*(8) have reported that vacci-

nated children have a somewhat better resistance to the disease since the low titres of protective antibodies, insufficient to prevent the disease, do afford a mild protection. However, in our study high mortality was observed inspite of partial vaccination. One of the explanations could be the adverse effect of OPV, which have not been studied so far and therefore, needs further investigation.

It appears that there is low credibility of OPV immunization in India in view of the high mortality in partially immunized children.

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