EPIDEMIOLOGICAL AND CLINICAL FEATURES OF ACUTE POLIOMYELITIS CHILDREN ADMITTED IN AN URBAN HOSPITAL

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ABSTRACT

Six hundred and fourteen acute poliomyelitis children (57% boys) admitted to the Institute of Child Health, Madras, during January 1988 to September 1989 were studied. Diagnosis was based on clinical grounds. The age ranged from 2 months to 75 months. Residents of Madras city area were 31%, the rest being from neighbouring district (55%) and states (14%). Only 24% got protected water supply and 26% had access to safe disposal of excreta. Only a quarter (26.4%) had been immunized with 3 or more doses of oral polio vaccine. Intramuscular injection was given in 70% within one month of onset of paralysis. The commonest presentation was spinal form (80%) followed by spinobulbar (18%) and bulbar form (2%). Paralysis was severe in 72%, moderate in 6% and mild in 22%. Case fatality was 3.3%. The age at paralysis and clinical features in India have not changed over years. We conclude that the immunization programme should be effectively implemented to the maximum efficiency especially for the poor/illiterate community. Clinicians must be educated to avoid unwarranted intramuscular injections for any febrile illness.

Key words: *Acute poliomyelitis, Epidemiology, Clinical features, Immunization, Intramuscular injection.*

Lameness surveys for poliomyelitis from various developing countries report the prevalence ranging from <1 to 19 per 1000 children below 5 years(1). In India, there was high incidence of cases reported each year with periodic spurts(2,3). Control of poliomyelitis apart from immunization, depends also on environmental sanitation to curtail the spread of virus(4). Susceptibility for paralysis is largely determined by factors like age at infection and immune status(5). The present study was designed to evaluate the epidemiological and clinical features of acute poliomyelitis admitted at the Institute of Child Health, Madras.

Material and Methods

The Institute of Child Health, Madras, is a sentinel center where almost all cases of poliomyelitis from the city are admitted. Cases were recruited prospectively from January 1988 to September 1989. The data were obtained by the Research Officer in a predesigned data card. The diagnosis was made on clinical grounds(6). The children were labelled as 'fully immunized', if they had received 3 doses of oral polio vaccine (OPV), 'partially immunized' if 1 or 2

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doses and 'unimmunized' if none. The nutritional status of the children was classified as per the Indian Academy of Pediatrics(7) classification. The data were analyzed with the help of SPSS software.

Results

The total number of cases recruited were 614, 57.3% being male. Nearly three-fourths (78.5%) of the cases were below 2 years of age and 6.5% were less than 6 months old (*Table I*). The youngest case was 2-months-old. Residents of Madras city were only 30.6%. There was no difference in the age at presentation among children from city, suburbs and other states ($p=0.06$). There was no seasonal variation in incidence. Mothers of 57.8% children were illiterate, 21 and 14.7% were educated upto primary and high school level, respectively. Both parents were illiterate for 29% of children. Nearly 80% of fathers were laborers.

The source of water for drinking was as follows: well 48.9%, corporation tap 24.1%, ground water pumps 11.4%, river 2.8%. Only 25.4% had access to safe disposal of excreta. Others practiced open air defecation. The distribution of clinical types of paralysis was spinal 489 (79.64%), bulbar 12 (1.95%) and spinobulbar 113 (18.41). There was no significant difference in the clinical types and the age at paralysis. The symptoms for which the children were brought to the hospital are shown in *Table II*. Only 13% were of normal nutritional status, 29, 42, 12 and 4% were of Grades I, II, III, and IV respectively. There was no significant difference in the clinical types between the grades of nutritional status ($p = 0.13$). Among these children, 26, 44, and 30% were fully immunized, unimmunized and partially immunized, respectively. There was no difference between the immunization status and the different clinical types ($p = 0.74$). History of intramuscular injection was present in 70% of cases.

TABLE I—*Acute Poliomyelitis: Age, Sex and Residential Status*

Age (mo)	Sex		Residential status			
	Male (n = 352) %	Female (n = 262) %	Madras city (n = 188) %	Suburbs (n = 336) %	Other states (n = 90) %	Total (n = 614) %
00-05	06.5	06.1	07.5	05.0	08.9	06.4
06-11	24.4	25.2	23.4	24.4	28.9	24.8
12-23	48.9	45.4	47.3	51.2	33.3	47.4
24-35	12.2	17.9	18.1	11.6	18.9	14.7
36-47	05.4	03.8	02.1	05.1	08.9	04.7
48-59	01.2	01.2	01.1	01.5	00.0	01.1
>60	01.4	00.4	00.5	01.2	01.1	00.9
Total	57.3	42.7	30.6	54.7	14.7	100.0

Note: The % are the nearest for the actual figures.

TABLE II—*Acute Poliomyelitis: Symptoms and Signs at Presentation*

Symptoms	(n = 614) %	Signs	(n = 614) %
Fever	94.3	Respiratory distress	4.7
Diarrhea	43.0	Altered sensorium	2.3
Loss of head control	22.2	Anxiety	1.3
Pain limbs	21.8	Phantom hernia	28.0
Feeble cry	21.5	Cranial nerve paralysis	18.9
Vomiting	9.9	Diaphragmatic paralysis	4.1
		Intercostal paralysis	2.3

Discussion

The age ranged from 2 to 75 months but 78.5 and 92.7% of the children were below 2 and 3 years, respectively. The median age at presentation was 15 months. The high incidence in infants and younger children has not changed over years in this region and in other parts of India as shown in *Table III*(3,8-11). The expected change in age due to the immunization program, usually an upward shift, is not seen. The proportion of cases from Madras city area alone shows a definite decline from 78% in 1981 to 31% in 1988-89. This reduction along with the reduction of total number of poliomyelitis cases is probably due to high coverage with TOPV.

As poliomyelitis is a feco-oral infection, improving the environment sanitation cannot be over emphasized. Increasing proportion of intramuscular injection among paralysed have been observed in the same institution over years, 42 and 66.6% in 1981 and 1984 to 70% now. Emphasis should be given to propagate the message among

TABLE III—*Acute Poliomyelitis: Proportion of Immunized and Age at Paralysis Over Years as Reported in the Literature*

Investigator*	No. of children studied n	Immunized %	Age in months			
			<6 %	6-11 %	12-23 %	> =24 %
Gujral	500	1.8	6.6	<——93.4——		—>
Maiya	201	8.5	4.5	19.0	32.0	44.5
Sundaravalli	516	10.0	<—53.0—>		31.0	16.0
Santhanakrishnan	895	10.0	<——74.0——		—>	26.0
Sharma	1796	14.0	7.9	<——92.1——		—>
Present study	614	26.4	6.4	24.8	47.4	21.6

*Studies from 1961-1989 in chronological order.

medical practitioners that intramuscular injection should be avoided unless it is warranted for an obvious bacterial infection.

The reported proportion of fully immunized among the paralyzed ranges from 1.8 to 35% over years as shown in *Table III*(3,8,10-12). Our data shows that a fairly high proportion has been immunized. In association with good immunization coverage (>80%) and reduction in total number of cases, this is to be expected.

Spinal polio was the commonest clinical type in our study, similar to other reports(3,8,9). Isolated facial palsy was observed in 3.6% of the cases.

Paralysis was observed to be mild in 22%, moderate in 6% and severe in 72%. Our data are similar to that of Sharma *et al.*(11) but differs from that of Gujral(10). The present case fatality rate 3%, is considerably lower compared to our previous reports of 14% and 10.7% in 1981 and 1984(3,9).

We conclude that since most of the unimmunized cases were from poor and illiterate community, who also lack protected water supply, steps are to be taken to implement the immunization program effectively for the expected coverage particularly for the above community. We also suggest that advancing the targeted age for evaluation of coverage of 3 doses of TOPV to under 6 months would prevent good proportion paralytic poliomyelitis.

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