Prevalence of paralytic poliomyelitis in Pondicherry, South India

S B ROTTI, S K SATPATHY, AND S P MEHTA

From the Department of Preventive and Social Medicine, Jawaharlal Institute of Post-Graduate Medical Education and Research, Pondicherry, India

SUMMARY A community health survey conducted in 16 villages of three blocks of Union Territory of Pondicherry detected lame children affected by poliomyelitis among other problems identified. The survey was conducted from July 1980 to September 1981. The survey method was house-to-house, covering 97% of the houses in the study area. Prevalence of lameness due to poliomyelitis among children aged from 6 to 15 years was 1·6 per thousand. These results were compared with those of the school health survey conducted by the School Health Education Bureau, Pondicherry, for the year 1980–1, which gave an estimate of 0·7 per thousand. The community health examination also confirmed that most of those affected were under 15 and that boys were more vulnerable than girls, as reported by other workers.

Poliomyelitis is still one of the major health problems in children in developing countries.^{1–3} Increasing incidence and cyclical trends have been reported from India.^{4,5} Investigations into the incidence are usually based on hospital statistics in the absence of reliable community data. The number of cases reported from some sentinel units is a gross underestimate of the actual problem,^{6,7} yet knowledge of the correct picture in the country is important to plan and execute immunisation programmes against this disease. The sequelae of poliomyelitis are distinctive, and surveys of lame children can help to estimate the prevalence of the disease. The *EPI Bulletin*⁷ of the Directorate General of Health Services, Government of India, has published guidelines on how to conduct surveys of lameness, which included modifications to those guidelines suggested by F Lare LaForce.⁸

The present study was undertaken to estimate by a house-to-house survey the prevalence of paralytic polio in the three blocks of Union Territory of Pondicherry and to compare the efficacy of this method with routine school health examinations.

Subjects and methods

COMMUNITY SURVEY

A community survey was conducted as a part of the Re-orientation of Medical Education Programme (ROME) using mobile clinics. Three blocks of the primary health centres of Union Territory of

Pondicherry were covered. The survey was done in six villages of Kalapet, six villages of Thavalakuppam, and three villages of Katerikuppam between July 1980 and September 1981. Each village was surveyed within a week by a team of eight to 10 personnel consisting of medical interns, postgraduate medical students of different specialties, and members of the teaching faculty from the department of preventive and social medicine. A predesigned and pretested proforma was used. Information regarding the cases of postpolio residual paralysis was elicited by asking the questions "Is there any person who is unable to walk properly?" and "Is there a person with a short or a thin limb?" If there were any such person polio was diagnosed if all the following criteria were fulfilled: (1) history of acute onset with no progression, (2) no diminution of sensory sensation, and (3) muscle weakness and atrophy.

Causes other than polio such as contractures due to burns, cerebral palsy, congenital malformations, recent injury, or infection were excluded.

SCHOOL SURVEY

The School Health Education Bureau of Union Territory of Pondicherry gets the health of all school-going children examined by medical officers of the State. It has a good documentation system, and receives the report of such medical examination of each student and a consolidated report from each school of the region. Data for the present study were

gathered from the records of the medical reports for the year 1980-1, sent from primary schools (classes 1-5), middle schools (classes 6-8), and high schools (classes 9 and 10) in the villages covered by house-to-house surveys.

Results

COMMUNITY SURVEY

A total of 4869 houses were covered by the house-to-house survey. The survey covered two blocks almost completely and about a half of the third block. The number of houses covered constituted 97% of the houses in the area. The remaining 3% were either deserted, collapsed, or whose inhabitants had migrated to other areas. The total population in the study area was 26 734, of whom 6683 (25%) were in the age group 6-15 years. There were 11 cases of children aged 6-15 with lameness due to poliomyelitis, giving a prevalence of 1.6 per thousand.

SCHOOL HEALTH SURVEY

The number of children aged 6-15 years was 6683, of whom 5908 (88%) were enrolled in the primary, middle, and high schools in the area and of whom, 5437 (93%) were examined during 1981-2. Of these, 3581 were boys and 1906 girls. Four cases of paralysis due to poliomyelitis were detected, giving a prevalence of 0.7 per thousand. All of these four were identified by the community survey.

The table shows the distribution of all lame people in the community survey according to age group and sex; 86% of the cases were aged under 15 years. Patients under 5 years constituted more than half of the total number of cases. Adults constituted only about one-seventh. Boys constituted 58.3% of the lame children detected in the community survey, whereas all the four lame children detected in school health survey were boys.

Discussion

Poliomyelitis is one communicable disease that can be effectively prevented with successful immunisation programmes. The urgency and the

speed with which polio immunisation programmes are to be implemented should be guided by properly conducted studies of prevalence and incidence of the disease before and after immunisation and of the uptake of the vaccine.

The most accurate technique to measure the prevalence of poliomyelitis is a house-to-house survey. Such surveys are time-consuming and are costly if carried out independently for one particular disease, but they have the great advantage of accurately specifying the characteristics of the population under study. The present study was a multipurpose health survey carried out under the Re-orientation of Medical Education Programme. One question on poliomyelitis was introduced in the predesigned and pretested proforma. This procedure entailed little extra time or cost either to the investigators or to the families. A total population was screened rather than a sample as this was part of the Re-orientation of Medical Education Programme.

Studies have shown that paralysis affecting the legs occurs in 75-90% of the cases.⁹⁻¹² So in the present study a correction for other cases not affecting the legs was made by multiplying the prevalence rate by a factor of 1.25. Since one-quarter of the cases, including deaths and complete recovery, are not detected in clinical surveys for residual paralysis, a correction for those who died or fully recovered was made by multiplying the prevalence rate by a factor of 1.33.⁸ So the prevalence of all cases of paralysis due to polio and all cases of polio among children aged 6-15 was 2.1 and 2.2 per thousand respectively, as detected by the community health survey.

Another method advocated to estimate the number of lame children due to poliomyelitis is a school survey. Since school health examinations are conducted annually in Pondicherry, we thought we would get the necessary information from the school health records of schools present in the village where we had done a house-to-house survey.

The community health survey detected out of 6683, 11 cases of lame children aged from 6 to 15, giving a rate of 1.6 per thousand, whereas the school survey out of 5487 children of the same age group in the same area yielded four cases, giving a prevalence of 0.7 per thousand, which is only 44% of the results in the community survey; the difference is statistically significant. The school health examinations are done routinely every year to check the general health of the children, and there is no specific question for poliomyelitis, so possibly the doctors did not pay special attention or did not have enough time to report such cases. Some cases therefore, may have been missed or wrongly diagnosed.

Age and sex of lame people in the community survey

Age (years)	Male	Female	Both sexes	
			No	(%)
≤5	13	7	20	55
6-15	7	4	11	31
≥16	1	4	5	14
Total	21	15	36	100

In a study conducted in Ghana¹³ (Danfa field project area) village health examinations showed that the prevalence of lame children aged from 6 to 15 was 4.6 per thousand. But in a specially conducted school survey in the same area the prevalence was 6.3 to 7.2 per thousand. In a school survey conducted in Chandigarh, India, covering school children of classes 1 to 5 the prevalence of lame children was 7.92 per thousand in urban areas and 4.38 per thousand in rural areas.⁸

The differences between the present study and the others may be due firstly to the method of study. In the Ghana study special emphasis was given to poliomyelitis in the village health survey, and the school health survey was done more carefully as teachers listed all lame children and the doctors paid special visits to the sampled schools and verified the diagnosis of poliomyelitis. A second difference may be the frequency of occurrence of poliomyelitis in particular age groups in our study—55% of cases were seen in children under 5 years whereas in school-going children they were only 31% of all cases. A third reason may be the existing immunisation programmes; in our study area the proportion of children aged under 5 years who received primary immunisation against poliomyelitis varied from 40% to 79% in the three different blocks, although these proportions could be inaccurate as the information was collected from the heads of households, most of whom were illiterate. But this may be why our prevalence rate of lameness was low compared with Chandigarh.

This study confirms the reports of other workers^{3, 5, 9, 11} that the great majority of the lame people affected by poliomyelitis are under 15 years. Regarding the vulnerability of boys, Pendey *et al*¹¹ and Sancheti *et al*,¹² have reported that boys constituted 66–67% of the paralytic polio cases, and a similar picture was seen in this study also.

In the light of the findings of the present study it would be beneficial to conduct mass general health surveys laying emphasis on poliomyelitis. Such surveys will have to be multipurpose. They need not be conducted every year in view of the costs, but at least once in five years to know the trends of incidence and to avoid duplication of previously identified cases. To make the school health surveys more useful, however, suitable emphasis should be given to poliomyelitis, and special efforts are to be made to make the medical officers more aware of all aspects of this problem. The findings of the present study confirm that poliomyelitis is still a problem of

the child population in India and needs priority. The existing programmes of immunisation against poliomyelitis will have to be further extended in the Pondicherry region.

We thank Dr Palanivelu of the Directorate of School Health Education Bureau, Pondicherry, and Dr M N Ghosh, director, Jawanarlal Institute of Postgraduate Medical Education and Research, Pondicherry.

Requests for reprints to: Dr S B Rotti, Department of Social and Preventive Medicine, Kasturba Medical College, Mangalore, 575001 (India).

References

- Basu SN. History of poliomyelitis in India. *Indian Paediatr* 1966; 3: 3–8.
- Hardas U, Waikar A. Pilot study of disabled children in and around Nagpur. *Indian J Paediatr* 1974; 41: 267–71.
- Gujral VV, Sharma D, Gangurde S, Gupta SP, Dhamija K, Chaudhari DS. Paralytic poliomyelitis in children. *Indian Paediatr* 1977; 14: 79–85.
- Halfkine Institute. *Annual report 1974–5*. Bombay: Halfkine Institute, 1975: 44.
- Chodankar VP, Dave KH. Pattern of prevalence of poliomyelitis in Greater Bombay. *J Indian Med Assoc* 1979; 73: 25–9.
- Directorate General of Health Services, Government of India. *Expanded Programme of Immunisation Bulletin* 1978; 1: No 4.
- Directorate General of Health Services, Government of India. *Expanded Programme of Immunisation Bulletin* 1979; 2: No 3.
- Directorate General of Health Services, Government of India. *Expanded Programme of Immunisation Bulletin* 1979; 2: No 4.
- Sachdeva KC, Gupta AC. Polio paralysis, clinical observations and management—report of 500 cases. *J Rehabil Asia* 1972; 13: 7–11.
- Punatar BJ, Patel DA. Pattern of residual paralysis in poliomyelitis. *Indian Journal of Orthopaedics* 1977; 2: 174–8.
- Pendey S, Alam B, Jhe SS, Agarwal SG, Pendey W. Polio paralysis. A critical review. *J Rehabil Asia* 1979; 20: 21–7.
- Sancheti KH, Sahasrabudhe BG, Bhingare RK, Elecriticwala JT. Clinico-environmental profile of residual paralytic poliomyelitis. *Indian Council of Medical Research Bulletin* 1981; 2: 59–66.
- Belcher DW, Nicholas DD, Ofosu-Amaah S, Kratzer HH. Comparison of methods for estimating the frequency of paralytic poliomyelitis in developing countries. *Bull WHO* 1979; 57: 301–5.