

POLIOMYELITIS IN INDIA

In May 1988, the 41st World Health Assembly committed the World Health Organization to the global eradication of poliomyelitis by the year 2000. The resolution specified that the polio eradication initiative should be pursued in ways that would strengthen the Expanded Programme of Immunization (EPI) and in 1989, a general Plan of Action was approved by the 42nd World Health Assembly. All the countries in the South East Asia Region (SEAR) have endorsed the resolution of World Health Assembly on eradication of poliomyelitis and have prepared national plans of action. The broad objectives of the polio eradication initiative are: (a) Achievement of zero polio case associated with wild polio virus, and (b) Absence of wild polio virus in all clinical and environmental samples obtained throughout the world.

The strategies to achieve eradication goal include (a) maintaining high immunization coverage in all countries, (b) using potent vaccine which meet WHO production requirements, (c) epidemiological and laboratory investigation of cases of flaccid paralytic diseases, (d) surveillance of the environment to document the absence of wild polioviruses anywhere in the world.

Magnitude of the Problem

A combined survey to estimate the incidence of poliomyelitis and neonatal tetanus

(NNT) was carried out in 14 states of the country in 1981, by the EPI section of Directorate General of Health Services (DGHS). The annual incidence rate of poliomyelitis in children of 0-4 years varied from 1.5 to 1.9 per thousand children(1). Based on this incidence rate, it was estimated that on an average, there were 1,40,000 to 1,70,000 cases of poliomyelitis in India. This incidence was highest in the world. In terms of population the incidence rate was about 25 per 100,000 population. Nearly 70% of children got poliomyelitis infection before they completed 2 years of age. Poliomyelitis was the cause of lameness among children of 5-9 years age in 62% of cases. The survey had shown that poliomyelitis was as much of problem in the rural area as in the urban. Less than one out of every 15 cases was reported to the Central Bureau of Health Intelligence (CBHI).

Surveillance of poliomyelitis through sentinel hospital is one of the simple methods to collect basic epidemiological data related to the disease. Kalawati Saran Children Hospital, Delhi; Kasturba Infectious Disease Hospital, Bombay; Hospital for Crippled Children, Calcutta; and Institute of Child Health, Madras were selected as national sentinel centres and retrospective data for the previous ten years were collected for study(2). In 1981 the incidence rate per 1 lakh population on the basis of resident cases was 8.5 and 14.5 at Bombay and Delhi, respectively.

Polio Vaccination Programme

Before 1978, some state health authorities, municipal corporations and

voluntary organizations carried out polio immunization programme in big cities on their own. On an average 10 million doses of Oral Polio Vaccine (OPV) were imported annually. Polio vaccine required stringent cold chain facilities. It was, therefore, decided that during the first phase of the programme, polio vaccination would be concentrated in large cities and towns with adequate cold storage arrangement. During 1979-80, the Government of India started to supply polio vaccine to supplement the State efforts, where the cold chain was well established. When the national survey to estimate the incidence of polio during 1981 found that polio was a major rural problem, polio vaccine was extended to rural areas along with the improvements of logistics of vaccine storage and distribution. Only from 1985, polio vaccine was made available throughout the country.

Three doses of OPV at an interval of one month are recommended. There is provision of booster dose at the age of 16-22 months. At the beginning, vaccination was limited to children under two years and the earliest age of polio vaccination was considered to be three months. From 1986, the vaccination is targeted to children under one but the older children are not denied services. The preponderant of earliest age of DPT and OPV administration to six weeks from three months was done in 1987. Administration of OPV at birth, as additional dose has been recommended in urban areas in 1989.

The National coverage of OPV 3 has increased from 15% in 1981 to 74% in 1989. There is, however a wide range of performance at State and District level. During 1987-88 in 11 States/Union

Territories out of 32, the OPV 3 coverage was less than 50% and in 1988-89, only 2 States had less than 50% coverage(4).

Production of Vaccine and Monitoring Cold Chain

India is not self sufficient in the production of OPV. Haffkine Bio-Pharmaceutical Corporation Ltd. Bombay (HBPCL) imported bulk concentrate of polio vaccine for types 1, 2 and 3, separately which were diluted, blended and ampouled in the country. Facilities for the indigenous production of OPV with a capacity of 100 million doses now have been established at HBPCL, Bombay. Department of Bio-Technology also has established a unit at Bullendshar, Uttar Pradesh, (Bharat Immunobiologicals) to produce OPV to meet the national requirement, and another unit at Haryana to produce killed polio vaccine (injectable). The Bullendshar unit at the final stage plan for indigenous production of 100 million doses. All vaccines were tested at National Quality Control Authority.

It has been decided to calculate the requirements of vaccine on the basis of 25% of wastage for all vaccines except measles and BCG, in which case it was 50%. Thus it is estimated that 110 million doses of OPV will be required for 1990-91.

Experiment on the use of cold chain monitor was carried out along with despatch of polio vaccine, in the States of Gujarat and Tamil Nadu in 1983. About 47 and 56% of the polio vaccines despatched from HBPC, Bombay to Madras (Tamil Nadu) and Vadodara (Gujarat) respectively, had at some time been exposed to higher temperature than desired. The findings indicated that the cold chain needed improvement. The Ministry of Health and Family Welfare (MOH & FW) initiated a

scheme of collection of sample of OPV from the field and sending it to nine designated laboratories for potency testing. In 1989, 82% of the samples collected were found satisfactory, as compared to 61% in 1980. There is, however, no mechanism to reach those children who had already been immunized with the batch of vaccine, later found unsatisfactory.

Declining Trend of Poliomyelitis

As a part of Nation EPI review(5), lameness survey was conducted in 35 Districts spread over 18 major States and four Metropolitan Cities. A total of 4,23,201 children below five years were surveyed and 1149 were found to be lame due to poliomyelitis. The prevalence rate worked out to be 2.71 per thousand children below five years. This was an underestimate as many of the children were still susceptible to poliomyelitis. After applying a correction factor of 1.25 for paralysis of the upper limb, and 1.33 for migrations and deaths, the corrected prevalence rate was 4.5 per thousand children below five years of age and the corrected annual incidence rate 0.90 per thousand. This incidence rate was lower than that found in the National Survey in 1981 (1.5-1.9 per thousand).

National sentinel hospitals located in the Metropolitan Cities of Bombay, Delhi and Madras, which attend to a large number of poliomyelitis cases, have also proved useful. The admission data indicates a declining trend of poliomyelitis in Bombay and Madras. These hospitals are now keeping data on the basis of residential status. Within the city, on the basis of addresses provided, maps showing endemic areas are prepared.

According to routine reports, 28,709 cases were reported to CBHI, in 1981

which has come down to 13,866 in 1989. Districts now send monthly reports of vaccination performance and disease incidence directly to National Immunization Mission of Ministry of Health Welfare. Nearly 150 districts reported less than 20 cases of poliomyelitis in 1989.

Epidemiological Classification of District

As a part of polio eradication initiative, the Districts will be classified on the basis of vaccination (OPV-3 doses) coverage of children under one and incidence of poliomyelitis cases, to determine priority activities. Districts in *Stage A* are considered to be polio-free. They have a reliable reporting system, have reported no indigenous cases of poliomyelitis for at least the previous three years and have immunization coverage rates with a protective course of polio vaccine among children reaching their first birthday of at least 80%. Districts in *Stage B* have fewer than 10 cases of poliomyelitis reported per year and have immunization coverage rates exceeding 50%. Districts in *Stage C* report 10 or more cases of poliomyelitis per year and have immunization coverage rates exceeding 50%. Districts in *Stage D* have 10 or more cases of poliomyelitis reported per year or the number unknown and/or immunization coverage rates of 50% or less or unknown.

In endemic Districts, i.e., in *Stages C and D*, priority activities will include improving immunization coverage to reduce the number of poliomyelitis cases. In Districts classified as A and B, every suspect case has to be investigated and virus isolation should be attempted. A national network of laboratories is being established in the country. Collection of fecal samples will initially be limited to cases seen in

large hospitals in Districts with coverage levels of 70% or above with the third dose of OPV in infants and low incidence of polio. Samples will also be collected in the sentinel hospitals in Bombay, Delhi and Madras where three of the national laboratories are located. Acute paralytic illness associated with the isolation of wild poliovirus, irrespective of residual paralysis will be considered as a confirmed case of polio. As the programme progresses, the laboratory services will be further developed, to undertake investigations involving intratypic differentiation of the virus isolates. When there will be no indigenous poliomyelitis cases, environmental sampling for poliovirus (sewage sample) will be taken up.

Pediatricians or any medical officer attending to suspect polio cases, has to play the role of a community physician. The case has to be notified to Municipal or District Health Officer for epidemiological investigation and initiating outbreak control measures. At the least, when cases are reported, all children living in the area should receive a dose of OPV. The age-group and extent of area to be covered, will

depend on status of polio eradication of the area and outcome of investigation.

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