

An Explosive Outbreak of Poliomyelitis in an Orphanage

Since 1914 there have been many reports of explosive outbreaks of poliomyelitis in orphanages or hospitals, all of which have been associated with injections of inflammatory substances. The earliest in Berlin in 1913 had a paralytic attack rate of 23% and further epidemics were reported from Rome and Naples until the 1950's (see reference 1 for a review of these and other epidemics). In these epidemics and with other single cases, the children were being treated for congenital syphilis with the arsenic drug Salvarsan or its derivatives.

In the New Delhi epidemic, we can assume that the children under 3 months were protected by maternal antibodies and those over 2 years of age by immunization or natural infection(2). The proportion of cases of paralysis increasing with age, 13% for 3-<6 mo, 14% for 6-<9 mo and 27% for 9-<12 mo follows the pattern of increasing susceptibility with age shown in other epidemics(3). There have been many other outbreaks in institutions with morbidity higher than the 4.9% cited in reference 2; eight between 5 and 24% are cited in reference(3).

The increased risk of poliomyelitis from diphtheria-pertussis-tetanus (DPT) vaccine depended on the inflammatory response, usually caused by the adjuvants(4). After provocation was recognized in 1950, the alum precipitated vaccines which increased the risk of polio by up to 5 times, were withdrawn. However, in the early 1960s, when oral polio vaccine (OPV) appeared to be safe, the adjuvants were again added to DPT. It would be interesting to know if the DPT used in 1992 in New Delhi was given by clean, sterile syringe(s) or whether there was further insult.

The term non-paralytic poliomyelitis is used to describe temporary paralysis; *i.e.*, 'inflammation of the grey matter' and does not include children with fever or minor illness virus in the spinal cord, but this is defined as only non-paralytic if there is actual, though temporary, paralysis. The statement that 'unapparent infection and "minor illness" usually exceeds that of paralytic cases by a hundredfold or even greater' (cited in reference(2) applies to infections with polioviruses of low or very low virulence, in populations with unknown, but high numbers with immunity, and where inflammatory injections have not been used either at the time of infection or for fever caused by virus in the spinal cord (aggravation)(5). It was written in the context of the USA where there have been no epidemics since the early 1960s, there was no wild virus and most people have immunity. In at least 32 epidemics there have been attack rates of paralytic poliomyelitis ranging from >1% to 25%(3).

I suggest that the children with febrile illness (fever) in the New Delhi orphanage were showing the combined effects of inflammation from the DPT and viremia with poliovirus provocation without paralysis. Some may have been suffering from abortive polio(6).

The dangers of poliomyelitis following intramuscular injections given to children in institutions have been known for eighty years. It is surprising and very fortunate that far more incidents have not occurred although some may not have been reported.

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Reply

We appreciate certain points raised by Dr. Wyatt in the context of our report on the explosive outbreak of poliomyelitis in an orphanage in Delhi in 1992. He has mentioned about a few more outbreaks in the literature which were equally or perhaps more explosive than the present outbreak. Nevertheless, these outbreaks were recorded when polio vaccine was not available. In this era of global eradication of poliomyelitis, such an outbreak is totally unacceptable.

When a susceptible individual is exposed to poliovirus, one of the following responses may occur: (i) inapparent infection, (ii) minor illness (abortive poliomyelitis), (iii) aseptic meningitis (non-paralytic poliomyelitis), and (iv) paralytic poliomyelitis. Since the diagnosis of poliomyelitis was reasonably certain in children who had only acute febrile illness (but no paralysis) during the outbreak, they were not subjected to the diagnostic lumbar puncture and were treated in the orphanage itself.

Recognition of the nonparalytic and the abortive forms is usually very difficult especially in infants and on the basis of merely clinical data. We therefore, used the term "nonparalytic poliomyelitis" in a broad sense to include all clinical forms other than paralytic poliomyelitis for the simplicity of description. Nevertheless, some of these cases were definitely showing stiffness and tenderness of the muscles of back, neck and limbs. It is perhaps sufficient to keep the records straight.

We however, do not attribute the occurrence of febrile illnesses in 21% of children in the orphanage to the inflammation from the DPT. The report provides enough evidence to suggest that these cases were indeed due to poliovirus infection. The epidemic curve (*Fig. 1*) also supports this inference; DPT was given on 24 July. Incidentally, disposable sterilized syringes were used to administer DPT to the children.

Finally, we believe that inapparent infections and pre-paralytic illnesses outnumber the paralytic cases in all settings;