## Pulse Polio Immunization

I was indeed surprised to read Dr. Jacob John's reply(l). He states "there is no evidence to show that vaccine virus circulates among children either after routine schedule based immunization or after pulse immunization using oral polio vaccine (OPV)! He states this inspite of compelling evidence to the contrary; "it is known that both wild virus and vaccine virus persist in the gut for 6 weeks and could interfere with vaccine uptake"(l). In fact, even the Redbook (1994) of the American Academy of Pediatrics makes this matter amply clear(2) by spacing two doses of OPV six weeks apart for this very reason.

Thus no further evidence is needed—certainly, vaccine virus will interfere, and if the pulse immunization is given too soon it may not take up. Furthermore, to make matters worse, it could certainly interfere with the next polio dose in routine vaccination. I would strongly recommend that children below 3 years who are undergoing the vaccination schedule in a proper manner be excluded from pulse polio immunization.

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## Comments

There are two phrases in Dr. Sanklecha's letter that we should pay attention to. They are "vaccine virus circulation among children" and "both wild virus and vaccine virus persist in the gut for 6 weeks". These phenomena are not one and the same. Persistence of poliovirus in the gut and prolonged virus excretion are quite well known. That is the reason why stool is examined for the presence of poliovirus in children with poliomyelitis. The incubation period of poliomyelitis can be upto 4 weeks; poliovirus may be isolated for one, two or even three weeks after the onset of paralysis. Thus, virus excretion could be present for 6 or 7 weeks. Similarly vaccine virus infection also persists for 3-4 weeks in the majority of children and upto and beyond 6 weeks in a small proportion of children.

Persistence of infection in the indi-

vidual child is not the same as vaccine virus circulation among children. Virus circulation results from the feco-oral transmission of infection over several generations of susceptible hosts. There is no evidence for such vaccine virus circulation either after routine immunization or after pulse immunization. Vaccine virus may transmit to a very limited extent, and for one generation only, within the family of an infant given OPV, provided the infant had vaccine virus take. But, that also is not virus circulation.

While wild virus infection of a child leads to virus circulation, vaccine virus infection does not lead to virus circulation.

Dr. Sanklecha's worry is about the possible short interval between one 'routine' OPV dose and one 'pulse' OPV dose. If the pulse dose of OPV has been interfered with by the persistent infection from the earlier routine dose of OPV, no harm has been done. The next routine dose can be postponed with an interval of four, six or eight weeks after the last pulse OPV dose, as the pediatrician desires. There is no scientific basis for Dr. Sanklecha's fear, that a dose of OPV which did not result in "take" could interfere with the "take" of the next dose of OPV. Therefore, there is no need for excluding any children from pulse immunization. Once the dates of the pulse immunization have been announced, the dates of the routine doses can be readjusted if so desired.

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## Pulse Immunization Against Poliomyelitis in India

This is with reference to the letter by Sanklecha on "Pulse Polio: Should we be giving it?(l), and the comments by Prof. Jacob John(2). As a member of the previous Immunization Advisory Committee of the IAP, which had recommended nation-wide pulse polio immunization programme(3) and as the Central Coordinator of the Pulse Programme in Delhi, I wish to make a few observations in relation to pulse polio immunization.

The efficacy of pulse polio immunization in rapidly controlling and eradicating poliomyelitis has been proven beyond doubt. The whole of Latin America has been declared 'polio-free' only because of pulse immunization drive. There is no doubt that under the prevailing conditions of environmental sanitation, this is the most appropriate method for rapid eradication of wild polio virus(4) and hence the answer to the question "should we do it?" is self evident. Yes, we should do it! Happily, Prof. Jacob John agrees with the same. Also as

pointed by him, an additional dose may at worst go waste, it never interferes with positive seroconversion. So together with pulse doses, routine immunization with OPV should also continue.

Prof. Jacob John has also succinctly pointed out the purpose of pulse polio immunization. While earlier it might have been only ah effort to increase coverage, but it's real purpose is to interrupt the transmission of wild polio virus and thus to rapidly eliminate the wide polio virus. Prof. Jacob John, however, wonders whether we have the methodolo-. gies to measure this *(i.e.,* interruption of transmission of wild polio virus) objective. He suggests that if we do not have these methodologies in place, then pulse immunization may be "premature". We only need to have a look at the experience of Latin American countries to answer his doubts. None of these countries put any methodology of measuring transmission of wild polio virus except for simple clinical surveillance of paralytic polio cases. Persistent absence of clinical paralytic poliomyelitis cases (for 3 years) was taken as enough evidence of elimination of wild virus. After all the proof of pudding is in it's eating! Thus we cannot agree with Prof. Jacob John's contention that pulse immunization efforts in our country would be "premature" at this stage.

So the question regarding pulse immunization with OPV now should not be whether we should do it, but how should we do it? The successful campaign in Delhi has shown that given the political will, we can also do it(5).

I agree with Prof. Jacob John that we all need to put our heads together under the initiative of the Central and various State Governments and chalk out a National Plan of Action for carrying out pulse immunization with OPV.

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## Comments

Much of Dr. Mittal's letter is devoted to endorsing some of the statements in my response to Dr. Sanklecha's letter regarding pulse immunization against poliomyelitis(l,2). I do not wish to try to use more space in the journal to continue that process. I shall only clarify questions or correct errors.

Dr. Mittal states that the previous Immunization Advisory Committee of

the IAP (1989-1994) had recommended nation-wide pulse polio immunization programme in 1989 and gives as reference a Report of the Committee. Since that Report is a Committee matter, and since it is not available to me for scrutiny, I cannot examine the recommendation in detail. To the best of my knowledge, the recommendation for nationwide pulse immunization in India was first made in an article published in 1983(3). It was not an arm-chair recommendation, but based on personal experimentation and experience of pulse immunization in Vellore town, in 1981. The first Vellore pulse with 3 doses at monthly intervals apparently interrupted virus transmission, as suggested (not proved) by absence of disease, whereas the first Brazil campaign with 2 doses did not even result in disappearance of the disease. Let me add for the record that the very term pulse immunization was coined in Vellore(4).

Let there be no doubt about my sense of urgency for nationwide pulse immunization and for eradication of poliomyelitis in India. We had the leadership for advancing poliomyelitis control and eradication, and also for leading the rest of the developing countries in this venture, 20 years ago. Lack of understanding, or agreement, or both, among our own ranks left us in disarray, while others progressed. Now, shall we simply imitate others as a ritual, or shall we organize ourselves to ensure success? The goal is not pulse immunization, it is eradication of poliomyelitis. They are not one and the same. One could set criteria for measuring the success and then do pulse immunization, or simply do pulse immunization and hope for the best. The difference between these two is not to be measured in time, but in the completeness of the planning and in evaluation of the outcome.

Dr. Mittal's statement that persistent absence of clinical paralytic poliomyelitis cases (for 3 years) was taken as enough evidence of elimination of wild virus in Latin American countries is only a figment of his imagination. There is active surveillance for acute flaccid paralysis (AFP) with 220,000 reporting stations to cover the entire population (which is less than one-third of that of India). Each reported AFP case has 2 stool samples collected for poliovirus isolation. In addition, stools are collected from 5 immediate contacts(5). Each poliovirus isolate is characterized to know if it was vaccine-like or wild. AFP continues to occur; but the last case of confirmed poliomyelitis *due to wild poliovirus* was in Pichinaki town of Peru, in August, 1991. Clinical poliomyelitis with vaccine-like viruses isolated from the stool, in the absence of concurrent wild virus, is excluded from consideration, as it is believed to be due to adverse reaction to the vaccine. During the 18 months since August 1991, nearly 9000 stools specimens had to be examined, but none yielded wild poliovirus(5). This process has continued now beyond 3 years after the last confirmed poliomyelitis due to wild poliovirus, without finding even a single isolate of wild virus. This is their evidence for the interruption of wild virus transmission. Absence of clinical disease will be described only as zero polio status and not as elimination of wild virus transmission.

If Dr. Mittal wants India not to put in

place methodologies for evaluating the achievement of the objectives, but yet invest heavily in the inputs, all I can say is that it is not a responsible altitude. The methodologies include effective surveillance plus virus isolation studies. For this purpose a network of virus laboratories have already been identified in India, staff trained and virus isolation studies already commenced. What is grossly lacking is 'understanding the objectives and methodologies by all concerned', which need to be corrected as soon as possible, and pulse immunization organized nationally, also as soon as possible. Using OPV in 2-dose pulses, Brazil took over 8 years to achieve zero polio status and interruption of wild virus transmission. With 3 doses as the pulse, we may be able to interrupt wild virus transmission in 3 months(3). If we do not do these immediately, history will repeat itself; we were one of the very last countries in the world to eradicate smallpox. Do we want to be qualified in this manner even for poliomyelitis eradication?

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