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**COMBINATION OF THE VACCINES SCHEDULES**

by

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Although it is now very widely known that many antigens can be given at the same time (though not necessarily physically combined) yet sometimes questions are still asked by our colleagues or our students as to whether it is correct to do this and whether there is no danger of loss of potency of one or more of the antigens.

Therefore, it seems useful to have a very brief review of some of the more recent literature, since the question does affect strategies and schedules.

#### Pertussis with Diphtheria and Tetanus vaccines (DPT)

"Pertussis vaccine given simultaneously with tetanus toxoid and diphtheria toxoid in man increases the antibody response to the latter." Quote from WHO Technical Report Series No. 595, 1976, p. 16. Therefore in this case the effect of Pertussis vaccine is actually to potentiate, not diminish the efficacy of the two other components of triple vaccine.

Long experience also indicates as good a potency of all three antigens in triple vaccine as when given separately.

#### Measles with DPT

A paper by F.L. Ruben and colleagues in the WHO Bulletin of 1973 (V. 48, p. 175-181) reported that when DPT vaccine was given to Nigerian children over 9 months of age together with (but at different sites) measles, smallpox and yellow fever vaccines, the measles sero-conversion rate was reduced from 89 to 70 per cent. They were not able to offer any explanation for this other than possible interference of the killed vaccine perhaps through interferon production with the "take" of the live vaccine, and they cautioned against using such combinations.

However, a special study was then conducted in Guatemala to clarify this important point. (Marshall R. et al). No interference was found by the diphtheria-tetanus toxoid and pertussis vaccines administered at the same time as measles vaccine in the sero-conversion rate of the measles vaccine. We are not aware either of any other study confirming the finding of Ruben et al and therefore favour at present attributing the partial failure in this case to other causes.

Cook's study in Uganda found the same sero-conversion to a low dose of measles vaccine when administered with DPT (2nd dose) as a Hong Kong study when the same dose of measles vaccine was given separately. At the same time the pertussis component was apparently successful.

Another study in Central America (Landrigo et al 1975) confirmed also that the simultaneous administration of DPT and trivalent oral polio vaccine with measles vaccine did not reduce measles sero-conversion, nor did the administration of the 2nd DPT and polio doses with BCG reduce tuberculin conversion.

Breman et al (1975) in Nigeria published only one in a series of at least five studies showing no interference between measles and smallpox vaccination.

The fact that trivalent polio vaccine does not interfere with DPT nor vice-versa is illustrated by polio sero-conversion and declining pertussis incidence Cook's study in Ankole, Uganda as well as by many other studies. Indeed at one time, and still today in some countries a "quadruple" (in fact with six antigens) vaccine of D,P,T and trivalent Salk (killed) polio vaccine was used, and has been used in some countries for many years with complete success in controlling all four diseases.

However, the fullest review of the subject is the paper of Foege and Foster of 1974. With twenty references they substantiate pretty completely the case for all combinations likely to be desirable for EPI projects.

All the papers referred to here are available in the special reference collection in the library.

### Schedules

The effect of these studies as regards the schedules commonly adopted, calling for at most three visits for primary immunization for the six diseases, including that recommended on page 14 of the Report of the Damascus EPI Seminar of 1975, is to give a scientific validity to them.

We may be free from anxiety of reduced potency, but it does not absolve us from the necessity to keep an open mind on the subject. This does not mean rejecting combinations on speculative grounds. It means the most careful surveillance we can manage about the effectiveness of the programme in respect of all the six diseases.

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