

# PARALYSIS AFTER ORAL POLIOMYELITIS VACCINE

## A COMPLEX INFECTION?

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REFERENCE has been made recently to the danger of blaming the vaccine when a paralytic disease follows oral poliomyelitis vaccination, without first excluding the possibility of concomitant infection with one of the other enteroviruses, which may itself produce paralysis, (Grist, 1963). The outcome of a simultaneous multiple virus infection may be the exclusion, by interference, of one or more of the agents, or two or more may multiply concurrently. The effect on the host of such a double (or multiple) infection, involving a poliovirus (or polioviruses) from vaccine, and another "wild" enterovirus, has perhaps received less attention than it merits.

Dalldorf and Weigand (1958) describe experiments in which monkeys were inoculated with Coxsackie A7 and 14 viruses, and with an avirulent poliovirus, type I. Inoculation of each of these viruses individually, intramuscularly and intracerebrally, caused no symptoms, nor did the simultaneous inoculation of a Coxsackie virus with the poliovirus. However, when the poliovirus was inoculated five days before the Coxsackie virus, paralysis developed in some 60% of the experimental animals. The importance of these results in relation to the use of living attenuated poliovirus vaccine (the oral or Sabin type), is obvious, and it is for this reason that the following case is reported, even though the investigation of it is incomplete.

### Case History

R.C., aged 20 months, a military dependant, was admitted to a civil isolation hospital (not in the U.K.) with weakness of a lower limb, diagnosed clinically as poliomyelitis. Three weeks before this, she had received a dose of trivalent oral (living attenuated) poliomyelitis vaccine. This had been preceded four weeks earlier by a single injection of inactivated (Salk type) vaccine. Her brother and sister, aged six and four respectively, who had both had three doses of inactivated vaccine, were not given oral vaccine, nor were her parents. Stool samples from the whole family were submitted to the Virus Laboratory, Royal Army Medical College, for study, the relevant results of which are shown in the Table. Unfortunately, no serum was obtained from any member of the family at the time of the incident, or immediately after it.

Bearing in mind that the human gastro-intestinal tract is much more readily colonised by human enteroviruses than is that of the monkey, and that a gut infection

TABLE

*Viruses isolated from stool samples*

Virus isolation system used	R.C. (case)	Brother	Sister	Father	Mother
Monkey kidney tissue culture	Poliovirus Type II	Poliovirus Type III	Poliovirus Type III	Nil	Nil
Suckling mouse inoculation	Coxsackie virus, Type A4	Coxsackie virus, Type A4	Coxsackie virus, Type A4	Nil	Nil

in the absence of circulating antibody must always lead to some systemic release of virus, there is a fair degree of similarity between Dalldorf's monkeys and the case described.

It would be wrong to draw any conclusions from this one example, or even to assume that all cases of paralysis associated with oral poliomyelitis vaccination are due to a single cause. It is worth remembering, however, that Coxsackie viruses are very widely distributed, particularly among children. On purely statistical grounds, it would be expected that some children receiving oral poliomyelitis vaccine either are already, or shortly will become, carriers of one of the Coxsackie viruses. Even if only a very small proportion of the children with such a double infection developed paralysis, this would easily account for many of the cases which have been reported. Cases of this sort associated with mass vaccination programmes will be distributed by geographical location, and by time, rather than by the origin and nature of the vaccine used.

It must be stressed that the foregoing should not inhibit in any way the use of poliomyelitis vaccine. Cases such as the one described are exceedingly rare, and, in the face of the undoubted value of the vaccine, should not be taken into account, particularly in military populations, who are exposed to a high risk of infection in tropical and sub-tropical areas.

### Summary

A case of paralytic illness occurring shortly after poliomyelitis vaccination with oral vaccine is described. From the stool of the patient, two viruses were isolated, a poliovirus and a Coxsackie 'A' virus. The possible significance of this double infection is discussed.

### REFERENCES

- DALLDORF, G. AND WEIGAND, H. (1958). *Poliomyelitis as a complex infection*. *J. exper. Med.* **108**, 605-616.
- GRIST, N. R. (1963). *Poliomyelitis and Coxsackie A7 Virus*. *Brit. Med. J.* **2**, 255.

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**HONORARY CONSULTANTS**

Mr. H. M. McGLADDERY, F.R.C.S., has been appointed Honorary Consultant in Surgery to the Army in Malaya as from 26th August, 1964.

Mr. NORMAN LESTER ROWE, F.D.S., H.D.D., M.R.C.S., L.R.C.P., has been appointed Honorary Consultant in Dental Surgery to the Army for a period of five years, in succession to Sir WILFRED FISH, C.B.E., M.D., D.Sc., F.D.S., R.C.S.

Professor GUAN BEE ONG, M.B., B.S., M.D., F.R.C.S.(Eng.), F.R.C.S.(Edin.) F.A.C.S., has been appointed Honorary Consultant in Surgery to the Military Hospital, Hong Kong as from 5th October, 1964.

Professor A. R. HODGSON, M.B., Ch.B., F.R.C.S.(E), has been appointed Honorary Consultant in Orthopaedic Surgery to the Military Hospital, Hong Kong as from 23rd October, 1964.