PARALYTIC POLIOMYELITIS IN ITALY (1981-85)


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Fifteen cases of presumptive poliomyelitis occurring in Italy between 1981-85 were studied in order to differentiate between paralysis caused by poliovirus and that of different etiology. Out of seven confirmed cases three were temporarily associated with vaccination.

Three aspects are discussed: i) the need for a careful differential diagnosis of paralytic cases; ii) the overconcern about the problem of vaccine-associated cases; iii) the risk connected with re-importation of wild poliovirus strains.

INTRODUCTION

Both Oral Polio Vaccine (OPV) and Inactivated Polio Vaccine (IPV) have been proved to be very effective in accomplishing a steady immunization (11, 21).

In countries where these vaccines have been used extensively, a dramatic decline of paralytic poliomyelitis has occurred over the last 25 years (6, 7, 9, 14).

In most European countries IPV was used for a few years during the late 1950’s. In the early 1960’s, OPV was widely adopted and is still being used on a large scale. Only Norway, Sweden, Finland and the Netherlands are currently vaccinating their populations exclusively with IPV. In these countries spread of wild poliovirus has been greatly reduced. It still occurs, however, particularly among small groups of the population who refuse vaccination on religious grounds as indicated by reports from Sweden (2) and the Netherlands, where 7 outbreaks occurred between 1961 and 1978 (19).

In 1984 Finland, which had had no cases in the previous 20 years nor wild poliovirus isolations reported, experienced an outbreak of paralytic poliomyelitis; this fact, coupled with the evidence of a re-established wild poliovirus circulation, prompted the Finnish Health Authorities to decide to vaccinate the entire population with OPV through a mass campaign (27).

In Italy OPV was introduced in 1964 and became a compulsory vaccination in 1966; consequently 539 cases occurred in 1966-80 against an annual average of over 3000 in the pre-vaccination era (18). In 1985 no cases of paralytic poliomyelitis were reported in Italy. Seroepidemiologic evidence of an excellent vaccination coverage in this country does exist, with the notable exception of the area of Naples (18). In countries where OPV is used, the incidence of vaccine-associated cases is estimated at less than 1 case per million vaccinated children (26).

We report the results of our investigations on 15 presumed cases of paralytic poliomyelitis reported in Italy between 1981-84 with particular reference to their possible association with OPV.
MATERIALS AND METHODS

Poliomyelitis is a reportable disease in Italy. Cases are reported on the basis of a presumptive diagnosis and confirmation follows reporting.

Fifteen cases, reported between Jan. 1981 and Dec. 1985, were investigated by collection of relevant demographic and epidemiological data, attempted virus isolation and characterization from biological materials, and sera testing for specific antibodies.

Pharyngeal, rectal swabs and CSF specimens were processed according to standard procedures (12) and inoculated into tube cultures of HEp-2 cells, Cincinnati variety.

Specimens which could not be processed immediately were frozen and stored at -20°C.

Cell cultures were monitored daily for arising cytopathic effect (CPE) and were considered negative only after at least 3 passages.

A HEp-2 cell microtitre technique with minor modifications (18) was adopted for titration of isolates (16).

Pools of Lim Benyesh-Melnick antisera (13) and hyperimmune antipolio horse sera were used for identification of isolates, both in micromethod and on HEp-2 cells.

Characterization of polioviruses was carried out through the RCT marker test on sub-primary monkey kidney cell tube cultures (1) and, mainly, through the cross-adsorbed sera according to van Wezel-Hazendonk on a HEp-2 cell microtitre technique (23).

In both these techniques the following wild and vaccine reference strains were used: Brunhilde, MEF-1 and Saukett; LSc2ab, Ch2ab and Leon12a,b.

Serological investigations of antipolio neutralizing antibodies were performed on HEp-2 microcultures using the same wild reference strains, stabilized by 1M MgC12 (25) as above.

In the same fashion serological diagnosis of « poliomyelitis-like » syndrome was accomplished using CoxB1-Conn5, CoxB2-Ohio, CoxB3-Nancy, CoxB4-JVB, CoxB5-Paulkner and CoxB6-Schmidt as reference strains.

RESULTS

Fifteen suspected cases of paralytic poliomyelitis were reported in Italy in the 1981-85 period, with an estimated incidence of 0.07 per million per year.

Demographic and epidemiological data are summarized in Table 1. Where possible, the dates of onset of symptoms and of paralysis are shown. In Table 2 our laboratory data are presented, together with the dates of collection of specimens, when known. Conclusions are drawn regarding non-polio cases. Finally in Table 3 data on intra-
typic differentiation and conclusions are presented concerning polio-cases.

Two cases (N and O) were found to be caused by non-polio enteroviruses. No definite etiology was found for 5 cases (From A to E). Case F entered Italy with an already ascertained diagnosis of poliomyelitis. The remaining seven cases (from G to M) were confirmed.

Out of the eight poliovirus isolates, three were Sabin-like (SL), (two type 2, one type 3) and 5 were non-Sabin-like (NSL) (two type 1, one type 3 from 3 separate cases, and, one type 1 and one type 3 simultaneously from another case). Two out of these 7 confirmed cases occurred in foreign children temporarily in Italy.

DISCUSSION

Reporting of suspected cases paralytic poliomyelitis is certainly appropriate and useful in epidemiological surveillance, but caution is needed in using this type of surveillance data which may include, (as in our series) diseases other than poliomyelitis or, at best, diagnostically questionable and imported cases.

Sabin himself pointed out « no poliovirus vaccine can be expected to eliminate the paralytic poliomyelitis that is caused by non-polio enteroviruses or the cases that have been diagnosed erroneously as paralytic poliomyelitis » (17).

It is well known that many enteroviruses are able to mimic poliomyelletic symptoms (17), though most of these cases show a full remission in a few months. This was the case with 2 of our patients with a « poliomyelitis-like syndrome », in which respectively Coxsockie B4 and B5 were recognized as etiologic agents. In the latter case a final hypothesis of immunodeficiency was advanced, based upon the absence of neutralizing antibodies against both Coxsockievirus B5 and the three poliovirus serotypes. The child had received four doses of OPV.

« New » Enteroviruses, such as type 71 (5, 20, 24), are also possible etiologic agents of « paralytic poliomyelitis » and therefore must be included in the differential diagnosis.

It should also be noted that in cases A, C and D confirmation was not possible due to lack of suitable specimens: the paralysis, however, regressed.

Cases B and E were considered highly probable though not definite cases of poliomyelitis on the basis of both persistence of paralysis and/or serological results.

If WHO criteria for classification of cases « temporally associated with vaccination » (26) are used, cases G and K in our series are possible examples of this serious complication, as « contacts ». Case L had symptoms 19 days after vaccination and it was thus considered compatible...