Abstract

In April 2001, CDC Taiwan received an individual case report of AFP from Linkou Chang-Gung Memorial Hospital. This individual was later diagnosed as an immunodeficiency poliovirus infection case. From then on in the following 11 months, one throat swab and eight stool specimens were collected from this particular case at day 5, 17, 18, 52, 54, 179, 224, and 337, respectively, after the onset of the disease. The sequence of the entire gene of each isolate was compared with that of Sabin Vaccine Type I, and the differences spread in a range from 1.80% to 2.96%.

Since these isolates showed no signs of genetic recombination, we assume that there are parts of the nucleotide and amino acids having gone through enough mutations to convert the non-infectious vaccine strain back to the original wild Mahoney strain. We estimated that it should take about 590 days to complete such a procedure, and it was indeed quite close to the time elapsed from the child last taking of OPV vaccine till the onset of the disease in the child. We figure the evolution rate involved to be around 1.2% per year.

This happened to be the first immunodeficiency and vaccine related polio case in Taiwan. Evidently, the patient will keep on excreting the virus for 11months. It raises a problem, however, in case polio vaccination is no longer in practice after global eradication of polio, because it is very possible such iVDPV would cause polio infections similar to cVDPV. This finding should be a science-based reference for the post-polio eradication vaccination strategy formulation.

Keywords：vaccine-derived poliovirus；vaccine-association poliovirus；evolution