

- virus. Arch. Virol., 142, 139-149.
9. Doi, K., Kawana, A., Iwamoto, A., Yoshikura, H. and Odawara, T. (1997): One base change is sufficient for host range conversion of murine leukemia virus from B to NB tropism. Arch. Virol., 142, 1889-1894.
  10. Rowe, W. P., Pugh, W. E. and Hartley, J. W. (1970): Plaque assay techniques for murine leukemia viruses. Virology, 42, 1136-1139.
  11. Hirt, B. J. (1967): Selective extraction of polyoma DNA from infected mouse cell cultures. J. Mol. Biol., 26, 365-369.
  12. Fujiwara, T. and Mizuuchi, K. (1988): Retroviral DNA integration: structure of an integration intermediate. Cell, 54, 497-504.
  13. Guntaka, R. V., Richards, O. C., Shank, P. R., Kung, H. J. and Davidson, N. (1976): Covalently closed circular DNA of avian sarcoma virus: purification from nuclei of infected quail tumor cells and measurement by electron microscopy and gel electrophoresis. J. Mol. Biol., 106, 337-357.

## Laboratory and Epidemiology Communications

### Surveillance of Poliovirus-Isolates in Japan, 1999

Tetsuo Yoneyama\*, Yoshiaki Karoji<sup>1</sup>, Kanako Watanabe<sup>2</sup>, Misako Tsuchiya<sup>3</sup>, Mamoru Nakano<sup>4</sup> and Tatsuo Miyamura

*Department of Virology II, National Institute of Infectious Diseases, Musashimurayama 208-0011,*

<sup>1</sup>*Kyoto City Institute of Health and Environmental Sciences, Kyoto 604-8845,*

<sup>2</sup>*Niigata Prefectural Research Laboratory for Health and Environment, Niigata 950-2144,*

<sup>3</sup>*Fukushima Institute of Health and Environmental Sciences, Fukushima 960-8163 and*

<sup>4</sup>*Nara Prefectural Institute of Public Health, Nara 630-8131*

Communicated by Tatsuo Miyamura

(Accepted May 29, 2000)

In 1999, 11 polioviruses were isolated from nine clinical patients in four prefectures. Samples of the viruses were sent to National Institute of Infectious Diseases (NIID) and subjected to the intratypic differentiation by PCR-restriction fragment length polymorphism method developed by Radu Crainic (1).

As shown in Table 1, all of the examined polioviruses were vaccine-derived strains. Type 3 poliovirus was isolated from the stool specimen of a poliomyelitis patient in Kyoto, and examined for intratypic differentiation in 1999. Since the onset of the paralysis in the Kyoto case occurred in November 1998,

Table 1. Characterization of poliovirus isolates in 1999

Code	Age	Sex	Date of vaccination		Date of onset	Date of sampling	Clinical diagnosis	Serotype	Intratypic differentiation
			in the patient	in the area					
99-kyoto-1	2Y	M	98-10-28(2nd)		98-11-19	98-11-19	Poliomyelitis	Polio-3	Vaccine-like
99-kyoto-2	7M	F	98-4-16		98-5-2	98-5-2	Aseptic meningitis	Polio-2	Vaccine-like
99-Niigata-1	1Y	F	98-10-23	99-4-16	99-4-5	99-4-9	Gastroenteritis	Polio-1&2	Vaccine-like
99-Niigata-2	2Y	M	98-11-2	99-4-5	Unknown	99-4-12	Erythema infectiosum	Polio-1	Vaccine-like
99-Fukushima-1	5Y	M	Unknown	98-10-30	99-2-17	99-2-17	*URD	Polio-1	Vaccine-like
99-Fukushima-2	7M	M	None	99-4-15	99-4-30	99-4-30	**ITP	Polio-2	Vaccine-like
99-Niigata-3	3Y	F	97-5-9(2nd)	99-5-14	99-5-31	99-5-31	URD	Polio-1	Vaccine-like
99-Niigata-4	7Y	F	Unknown	99-4-13	99-6-24	99-6-25	Herpangina	Polio-1	Vaccine-like
99-Nara-1	8M	F	None	99-10-26	99-11-24	99-11-24	Diarrhea	Polio-2&3	Vaccine-like

\* : Upper respiratory disease

\*\* : Idiopathic thrombocytopenic purpura

\*Corresponding author: Fax: +81-42-561-4729, E-mail:tyoneyam@nih.go.jp

Table 2. Annual incidence of typical poliomyelitis (1970-1999)

Year	No. of cases			No. of cases with indicated serotypes					
	Total	Attempted for virus isolation	Poliovirus positive cases	1	2	3	1,3	2,3	1,2,3
1970	5	5	3	-	2	1	-	-	-
1971	2	2	2	-	1	1*	-	-	-
1972	2	2	2	-	1	-	-	1	-
1973	6	6	5	-	4	1	-	-	-
1974	3	3	2	-	2	-	-	-	-
1975	1	1	1	-	-	-	-	-	1
1976	1	1	0	-	-	-	-	-	-
1977	2	2	2	-	2	-	-	-	-
1978	1	1	1	-	-	-	-	1	-
1979	1	1	1	-	1	-	-	-	-
1980	4	4	4	1*	1	-	-	2	-
1981	4	4	2	-	1	-	-	1	-
1982	0	0	0	-	-	-	-	-	-
1983	2	2	1	-	1	-	-	-	-
1984	0	0	0	-	-	-	-	-	-
1985	1	1	1	-	1	-	-	-	-
1986	1	1	1	-	-	1	-	-	-
1987	0	0	0	-	-	-	-	-	-
1988	0	0	0	-	-	-	-	-	-
1989	0	0	0	-	-	-	-	-	-
1990	0	0	0	-	-	-	-	-	-
1991	1	1	1	-	-	-	-	1	-
1992	2	2	2	-	-	2	-	-	-
1993	3	3	3	-	2	1	-	-	-
1994	1	1	1	1	-	-	-	-	-
1995	0	0	0	-	-	-	-	-	-
1996	0	0	0	-	-	-	-	-	-
1997	0	0	0	-	-	-	-	-	-
1998	2	2	2	1	-	1	-	-	-
1999	0	0	0	-	-	-	-	-	-

\*: Non-vaccine-like

the total number of incidences of poliomyelitis in 1998 was two, including the case in Hokkaido (2). Poliomyelitis cases in Japan from 1970 to 1999 are summarized in Table 2 for reference.

In the Kyoto case, paralysis developed after the second administration of oral poliovirus vaccine (OPV). Poliomyelitis after 2 doses of OPV has been never reported in these 30 years except for two cases involving immunodeficient patients in 1977 and 1979, respectively. The average number of reported incidences of poliomyelitis associated with OPV is thus one per year, indicating one case per four million doses for the last 20 years. In some cases, polioviruses have been isolated more than 5 months after the last OPV administration, but it is generally unlikely that vaccine strains persist in humans for more than 2 months. Contact infection from vaccinees is possible, but no secondary infections from vaccine-associated cases have been reported.

The last wild poliovirus in Japan was isolated from a case of poliomyelitis in Nagano Prefecture in 1980 (3). Imported wild poliovirus was isolated from a non-paralytic patient in Shiga Prefecture in 1993 (4). Although it is considered that there is no wild poliovirus circulating in Japan (5), a retrospective study of acute flaccid paralysis (AFP) surveillance was conducted in 1998, and a prospective study was performed in 1999 for certification of Japan's polio-free status. No poliovirus

was isolated from AFP patients examined in 1999. The importance of strengthening poliovirus surveillance until global eradication of poliomyelitis should be emphasized.

REFERENCES

1. Balanant, J., Guillot, S., Candrea, A., Delpeyroux, F. and Crainic, R. (1991): The natural genomic variability of poliovirus analyzed by a restriction fragment length polymorphism assay. *Virology*, 184, 645-654.
2. Yoneyama, T., Sawada, H., Sekine, H., Sasagawa, A., Futohashi, Y., Sakurai, N., Yokota, Y., Ishizaki, T., Karoji, Y., Nakano, M., Kajiwara, K., Hagiwara, A. and Miyamura, T. (1999): Surveillance of poliovirus-isolates in Japan, 1998. *Jpn. J. Infect. Dis.*, 52, 19-20.
3. Hara, M., Hagiwara, A., Yoneyama, T., Saito, Y. and Shimojo, H. (1983): Antigenic and biochemical characterization of poliovirus type 1 isolates of non-vaccine origin. *Microbiol. Immunol.* 27, 1057-1065.
4. Yoneyama, T., Fujiwara, T., Yokota, Y., Takemika, Y. and Hagiwara, A. (1995): Characterization of a wild poliovirus type 3 isolated Japan in 1993. *Jpn. J. Med. Sci. Biol.*, 48, 61-70.
5. Shimojo, H. (1984): Poliomyelitis control in Japan. *Rev. Infect. Dis.*, 6, S427-430.