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Surveillance of Poliovirus-Isolates in Japan, 2001

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In 2001, 20 poliovirus isolates were obtained from 12 clinical patients and two healthy individuals in seven prefectures in Japan. They were sent to the National Institute of Infectious Diseases (NIID) and subjected to intratypic differentiation by the PCR-restriction fragment length polymorphism method developed by Dr. Radu Crainic (1). As shown in Table 1, all were found to be vaccine-derived. From three transient paralysis cases which were probably associated with oral poliovirus vaccine (OPV), four isolates were obtained. Their serotypes were dissimilar (cases 2, 10, and 11). Case 1 was probably unrelated to OPV which he received because the interval between the vaccination and the onset of paralysis was only one day. Five isolates were obtained from four non-vaccinees in Niigata Prefecture from April to June, one with transient paralysis and three without paralysis (cases 4, 5, 7, and 10); as vaccination in the spring season had been implemented in the area, those isolations were considered

contact infections from unknown vaccinees.

There were no vaccine-associated paralytic poliomyelitis (VAPP) confirmed by virus isolation. Interesting was a 38-year-old male case found in Kyoto; the case was clinical poliomyelitis and, though virus isolation was negative, showed a rise of neutralization antibody against poliovirus type 2 in the patient's cerebrospinal fluid. He was probably infected by poliovirus through his healthy daughter who received OPV one month before. Similar adult poliomyelitis cases by contact infection from asymptomatic vaccinees in the patient's family were reported in Hokkaido in 1998 (2) and in Miyazaki Prefecture in 2000 (3). Types 1 and 3 polioviruses were isolated respectively from these cases.

After the introduction of OPV in 1961, the incidence of poliomyelitis declined dramatically in Japan. However, 36 VAPP cases were reported in 1970-2000 (3). Though extremely low in incidence, VAPP never disappears. Paralysis

Table 1. Characterization poliovirus isolates in 2001

Case No.	Code	Area	Age	Sex	Date of vaccination	Date of onset	Date of sampling	Clinical diagnosis	Serotype	Intratypic differentiation
1	01-151-1	Niigata	1Y	M	01-04-27 (2nd)	01-04-28	01-05-01	Transient paralysis	Polio 3	Vaccine-like
2	01-012-1	Sapporo	11M	F	01-05-08	01-05-17	01-05-21	Transient paralysis	Polio 1 & 2	Vaccine-like
3	01-211-1	Gifu	10M	M	01-05-21	01-05-24	01-05-24	Fisher's syndrome	Polio 1, 2 & 3	Vaccine-like
4	01-151-2	Niigata	1Y	M	None	01-04-05	01-04-07	Fever	Polio 2 & 3	Vaccine-like
5	01-151-3	Niigata	5M	M	None	01-04-24	01-04-25	Gastroenteritis	Polio 3	Vaccine-like
6	01-151-4	Niigata	11M	M	01-04-06	01-04-21	01-04-21	Diarrhea	polio 2 & 3	Vaccine-like
7	01-151-5	Niigata	1Y	F	None	01-04-20	01-04-23	Diarrhea	Polio 3	Vaccine-like
8	01-151-6	Niigata	3Y	F	99-05-20	01-04-26	01-04-27	Gastroenteritis	Polio 3	Vaccine-like
9	01-151-7	Niigata	1Y	M	01-05-17	01-05-17	01-05-31	Diarrhea	Polio 3	Vaccine-like
10	01-151-8	Niigata	1Y	M	None	01-06-12	01-06-16	Transient paralysis	Polio 1	Vaccine-like
11	01-461-1	Kagoshima	2Y	M	01-06-14 (2nd)	01-07	01-07-30	Transient paralysis	Polio 3	Vaccine-like
12	01-211-2	Gifu	11M	M	01-05-31		01-08-30	Healthy	Polio 2	Vaccine-like
13	01-381-1	Ehime	9M	M	None		01-09-27	Healthy	Polio 2	Vaccine-like
14	01-151-9	Niigata	7M	F	01-10-05	01-10-16	01-10-30	Kawasaki disease	Polio 1 & 3	Vaccine-like

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associated with OPV or caused by infection with circulating vaccine-derived polioviruses (4) is unavoidable so long as OPV continues. Switching from OPV to the inactivated poliovirus vaccine is an option in polio-free countries.

REFERENCES

1. Balanant, J., Guillot, S., Candrea, A., Delpeyroux, F. and Crainic, R. (1991): The natural genomic variability of poliovirus analysed 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. Yoneyama, T., Sakae, K., Baba, J., Nakayama, T., Chijiwa, K., Kizoe, K., Shimizu, H., Iizuka, S., Ishizaki, T., Kondo, R. and Miyamura, T. (2001): Surveillance of poliovirus-isolates in Japan, 2000. *Jpn. J. Infect. Dis.*, 54, 80-82.
4. Kew, O., Morris-Glasgow, V., Landaverde, M., Burns, C., Shaw, J., Garib, Z., Andre, J., Blackman, E., Freeman, C. J., Jorba, J., Sutter, R., Tambini, G., Venczel, L., Pedreira, C., Laender, F., Shimizu, H., Yoneyama, T., Miyamura, T., van der Avoort, H., Oberste, M. S., Kilpatrick, D., Cochi, S., Pallansch, M. and de Quadros, C. (2002): Outbreak of poliomyelitis in Hispaniola associated with circulating type 1 vaccine-derived poliovirus. *Science*, 296, 356-359.