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Intrafamilial Transmission of a Sabin 1-Related Poliovirus in Shizuoka Prefecture, Japan

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On June 6, 2005, a 41-year-old male presented with fever (39.0°C) and malaise, and was admitted to a clinic in Shizuoka Prefecture, Japan. Immediately before the onset, the patient had taken care of his 9-month-old daughter, who had diarrhea and who had previously received her first dose of oral poliovirus vaccine (OPV) on May 30, 2005.

To address the possibility of vaccine-associated paralytic poliomyelitis (VAPP) due to intrafamilial poliovirus transmission, clinical samples were collected from the patient and his vaccinated daughter on June 10 for virus isolation and identification. Polioviruses were isolated from a throat swab of the patient and from a stool sample of the daughter in Vero cells (1). Both isolates were identified as a type 1 poliovirus by the microneutralization test (Table 1). Two different methods, which were based on genetic and antigenic approaches and which used PCR-restriction enzyme fragment length polymorphism and Sabin-specific monoclonal antibodies, respectively, were employed for intratypic differentiation (ITD) of polioviruses to distinguish between the vaccine and wild polioviruses (2,3). As shown in Table 1, the ITD assays identified both type 1 poliovirus isolates as Sabin 1-like polioviruses, which were commonly found in the stool samples from healthy OPV recipients and their close contacts (4,5).

During clinical follow-up, the patient and his daughter completely recovered without any sequelae, although intrafamilial transmission of the type 1 OPV strain was epidemiologically suspected. However, another possible VAPP case, that of a 36-year-old male who had a contact infection with type 3 OPV strain from his son, was recently reported in Ehime Prefecture, Japan (6). These incidents revealed the existence

of susceptible populations and the risk for VAPP as long as OPV is still used in Japan (7), and provide a strong argument for the introduction of an inactivated poliovirus vaccine instead of OPV to reduce the risk of VAPP, concomitant with routine OPV immunization (8,9). In the meantime, highly qualified disease and laboratory surveillance activities for VAPP are also needed.

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Table 1. Virus isolation and characterization of polioviruses

Virus ID	Sample			Poliovirus isolate			
	Source	Sample	Date of sampling	Serotype	ITD		Final result
					PCR-RFLP ¹⁾	MoAb ²⁾	
0517	Patient	Throat swab	June 10, 2005	Type 1	Sabin 1	Sabin-like	Sabin 1
0518	Daughter	Stool	June 10, 2005	Type 1	Sabin 1	Sabin-like	Sabin 1

¹⁾: PCR-restriction enzyme fragment length polymorphism test as a genetic intratypic differentiation (ITD) assay.

²⁾: Neutralization test using Sabin-specific monoclonal antibodies as an antigenic ITD assay.

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