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Analysis of Adenoviruses Isolated in Kobe City, Japan, from 2000 to 2007

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Adenoviruses cause various types of illness in children. A total of 346 adenovirus isolates were obtained from 236 patients admitted to the pediatrics department at Kobe City Medical Center General Hospital from April 2000 to December 2007.

Throat swabs, feces, urine, or conjunctiva swabs were inoculated to FL, HEp-2, Vero-E6, and RD-18S cell cultures. Throat swabs and fecal samples were used for most cases. Adenovirus isolates were typed using antisera provided by the National Institute of Infectious Diseases, Japan and the Denka Seiken Co., Ltd. (Tokyo, Japan).

Of 346 isolates, 175 (50.6%) were isolated from fecal samples, 148 (42.8%) from throat swabs, 10 (2.9%) from conjunctiva swabs, 7 (2.0%) from nasal swabs, and 4 (1.2%) from urine samples. Clinical diagnoses of the 236 cases are

shown with information of serotypes in Table 1. Of 236 cases, 93 (39%) were diagnosed as upper respiratory inflammation, 32 (14%) as lower respiratory inflammation, 30 (13%) as invagination, 24 (10%) as fever of unknown origin, and 20 (8.5%) as gastroenteritis. Concerning serotypes, adenovirus type 3 (Ad3) was detected most frequently (89 cases, 38%), followed by Ad2 (75 cases, 32%), Ad1 (32 cases, 14%), and Ad5 (23 cases, 9.7%). Ad3 (49%) was isolated most frequently from the cases diagnosed as upper respiratory tract inflammation, followed by Ad2, Ad1, and Ad5. Ad2 was most frequently isolated from the cases with lower respiratory tract inflammation or invagination. The number of adenovirus isolates tended to be high from April to July, compared to that from August to March (Fig. 1). There were no significant yearly differences in the percentages of isolated serotypes.

Table 1. Adenovirus detection, 2000-2007 (by serotype, year and diagnosis)

Serotype	Year								Total	Clinical diagnosis										
	2000	01	02	03	04	05	06	07		Upper respiratory inflammation	Lower respiratory inflammation	Gastroenteritis	Invagination	FUO	PCF	EKC	Croups inflammation	ASM	UTI	Others
Ad1	7	3	2	9	3	5	1	2	32	13	6	1	5	2	0	0	2	1	1	1
Ad2	11	15	16	11	8	8	3	3	75	26	14	5	11	10	1	0	0	2	2	4
Ad3	20	12	16	17	2	5	13	4	89	44	8	11	5	12	3	0	1	3	0	2
Ad4	0	1	0	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
Ad5	3	4	4	2	2	6	2	0	23	6	4	2	7	0	0	0	0	0	1	3
Ad6	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Ad8	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0
Ad11	1	0	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	3	0	0
Ad31	0	0	0	1	1	3	0	1	6	1	0	1	2	0	0	0	1	0	0	1
Ad37	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	3	0	0	0	0
Total	44	35	38	44	19	27	19	10	236	93	32	20	30	24	4	5	4	6	7	11

FUO, fever of unknown origin; PCF, pharyngoconjunctival fever; EKC, epidemic keratoconjunctivitis; ASM, aseptic meningitis; UTI, urinary tract infection.

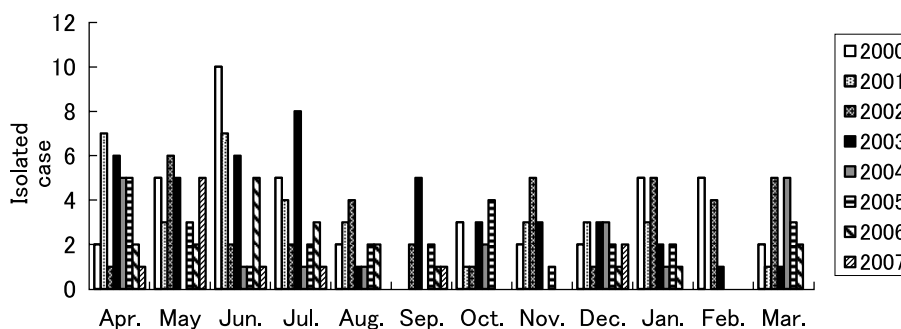


Fig. 1. Monthly distribution of adenovirus isolation.

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Adenoviruses are widely distributed, common pathogens. When causative agents of respiratory illness, digestive illness, and fever of unknown origin are investigated, adenoviruses must be taken into consideration along with enteroviruses in

summer and influenza viruses in winter.

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