Spread of epidemic keratoconjunctivitis due to a novel serotype of human adenovirus in Japan

Hiroaki Ishiko* and Koki Aoki

1. Host Defense Laboratory, Mitsubishi Chemical Medience Corporation, Tokyo 108-8559, Japan
2. Department of Ophthalmology and Visual Sciences, Hokkaido University Graduate School of Medicine, Sapporo 060-8638, Japan

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*Corresponding author: Hiroaki Ishiko, Ph.D., Advanced Medicine Research Department, Mitsubishi Chemical Medience Corporation, Shibaura 4-2-8, Minato-ku, Tokyo 108-8559, Japan
Phone: +81-3-6722-4240; Fax: +81-3-6722-4231;
E-mail: Ishiko.Hiroaki@mp.medience.co.jp
To the Editor- We have reported a novel human adenovirus (HAdV) that has caused nationwide epidemic keratoconjunctivitis (EKC) in Japan [J. Clin. Microbiol. 2008; 46:2002-2006]. This virus has been characterized serologically and genetically as a novel serotype, and we propose naming it HAdV-53.

Adenovirus EKC is typically caused by three serotypes of HAdV-D, namely HAdV-8, -19, and -37, and one serotype of HAdV-E, namely HAdV-4. These strains frequently cause nosocomial outbreaks (3-5, 17) and were originally isolated from patients with EKC in 1951, 1955, and 1976 (8, 9, 11). Although several variants, including a novel hexon-chimeric intermediate type (HAdV-22, 37/H8), have also been described (1, 2, 6, 7, 10, 13, 16), no other new serotype has appeared. HAdV-53 was first isolated from an EKC patient in Kobe, western Japan, in 2000, and then caused an EKC epidemic in 2000-2007. During this epidemic, 343 HAdVs were isolated from patients with EKC, from 16 nosocomial infections and 15 sporadic infections. The HAdV-53 caused 5 (31.3%) of 16 nosocomial infections and 5 (33.3%) of 15 sporadic infections. Other four serotypes accounted for 51.6%, and HAdV-22,37/H8 was responsible for 16.1%, of both types of infections.

HAdV-53 continued to cause EKC in 2008 (Fig. 1). It has been reported only in Japan, but it is not yet known whether HAdV-53 is limited to this country. Also, the origin and route of transmission of HAdV-53 are unknown. The phylogenetic analysis indicates that HAdV-53 had already appeared in 1995 as the causative agent of EKC.
other hand, HAdV-53 was not founded from the specimens collected in the Saudi Arabia, Austria, Nepal, Bangladesh, and Vietnam (12, 14, 15). It is also possible that this virus may be circulating in humans with asymptomatic infection, although no asymptomatic infection was detectable in the present study. The virus might gain pathogenesis by some unknown mechanism. In cell culture, HAdV-53 grows slowly, and the Kobe strain was isolated after eight blind passages. Because this strain is close to HAdV-8 according to both neutralization assays and phylogenetic analyses, it has been diagnosed occasionally as HAdV-8. In Japan, approximately 1,000 HAdV strains were isolated from patients with EKC in 2003-2007 (Infectious Agents Surveillance Report URL: http://idsc.nih.go.jp/iasr/29/338/tpc338.html). The major causative agents were HAdV-4 and HAdV-19a and -37, and several HAdV-8 infections have also been isolated. As EKC infections due to HAdV-8 have apparently been rare after 2000, we undertook phylogenetic analyses to confirm the causative HAdVs, using partial hexon sequences derived from all prototypes of HAdV serotypes, including a novel HAdV-53. We found that HAdV-8 strains reported during 2003-2005 were actually HAdV-53. The novel serotype HAdV-53 should therefore be monitored worldwide as an emerging adenoviral infection.

References


82 Sapporo, Japan, for more than 10 years. J Clin Microbiol 43:726-32.


Figure Legend

Fig. 1. Nosocomial and sporadic EKC infections analyzed in Japan during 2000-2008. A total 343 HAdVs were obtained from patients with EKC from 16 nosocomial (red circles) and 15 sporadic (blue circles) infections during 2000-2008. The HAdV-53 was isolated from nosocomial infections (red labeling) or from sporadic infections (blue labeling).