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New vaccine delivery system: Development of intranasal inactivated influenza vaccine

○ Hideki HASEGAWA[1]
[1]Dept. of Pathology, National Institute of Infectious Diseases

The current influenza vaccine can not prevent the infection itself. In order to protect against infection with a vaccine, it is necessary to induce secretory IgA antibodies capable of neutralizing on the airway mucosa which is the infection site. Moreover, since secretory IgA antibody has cross-protective ability, it is thought that a mutant strain can be prevented. We are studying a nasal influenza vaccine capable of inducing a secretory IgA antibody. We have examined the efficacy of nasal vaccine by measuring neutralizing antibodies of nasal washings and serum induced after nasal influenza vaccination in humans. Nasal inoculation of influenza inactivated whole particle vaccine induced neutralizing antibodies not only in serum but also in nasal washings. It was revealed that subtype of antibody responsible for neutralization reaction is IgA antibody in nasal washings and IgG antibody in blood. In the nasal washings, it was shown that the neutralizing activity was high for IgA antibody, especially secretory multimeric IgA antibody. From these results, it has been shown that nasal influenza vaccine induces antibodies having the ability to neutralize virus on the airway mucosa, which is the local infection site, and it is important to induce these antibodies for protection against influenza virus infection.