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Seroepidemiological Survey of Influenza C Virus in Hiroshima Prefecture, Japan

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Influenza C virus, which was first isolated from a patient with a mild influenza-like illness in 1947 (1), has been considered an etiological agent for respiratory infections in human beings (2). However, the epidemiological information regarding this virus, such as the mechanisms of its transmission and maintenance in nature, have been limited, as compared with those of influenza A and B viruses. We investigated the antibody prevalence of this virus in the residents of Hiroshima Prefecture to elucidate the extent of influenza C virus infection, and in this paper we report the results of the age distribution of antibody against influenza C virus in comparison with those against influenza A and B viruses.

A total of 186 sera, which were collected from residents living in Hiroshima Prefecture in the age range of 0–84 years in 1997, were measured for hemagglutinin-inhibition (HI) antibody titer against influenza A, B, and C viruses. The age-related distribution of HI antibody and the positive rate in age groups against influenza C, A, and B viruses are shown in Figures 1 and 2. Significant levels of HI antibody-positive rate (134/186: 73.6%) against influenza C virus were found in the sera tested, with the titers ranging from 1:10 to 1:80. The pattern of the HI antibody-positive rate in age groups against influenza C virus was markedly different from those of influenza A and B viruses; a high percentage of antibody-positive rate (more than 50%) was shown only in the age group of 0–14 years against NSydney/5/97(H3N2) or in that of 5–24 and 30–39 years against B/Harbin/7/94, while the positive rate against A/Beijing/262/95(H1N1) was generally low in all age groups. In contrast, the antibody-positive rate against C/Hiroshima/290/99 was high in all age groups except for that of 0–4 years. Similar antibody-prevalence patterns in age groups against influenza C virus have also been reported.

Fig. 1. Age-related distribution of antibody and antibody-positive rate in age groups against influenza C virus. Hemagglutinin-inhibition (HI) titers of 186 sera collected from residents of Hiroshima Prefecture in 1997 were determined using the microplate technique described by Homma (3). The antigen for HI test was the isolate of influenza C virus (C/Hiroshima/290/99) (5). HI titers were expressed as the reciprocal of highest serum dilution that inhibited hemagglutination, and were plotted against age. The percentages of antibody-positive sera (HI titer of 1:10 or more) were determined every 5 years of age, and are shown as bars on the graph.

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in previous studies (3,4). Thus, we speculate that primary infection by this virus mainly occurs early in life and reinfection plays a role in maintaining the antibody at high levels, as described by Homma (3). We are currently conducting a virological surveillance on the occurrence of this virus to obtain additional epidemiological information (5).

REFERENCES