

**Serological Investigation of
Subclinical Influenza A(H7H9)
Infection Among Healthcare
and Non-Healthcare Workers
in Zhejiang Province, China**

TO THE EDITOR—As of 29 May 2013, the National Health and Family Planning Commission, China, notified the World Health Organization (WHO) of 132 laboratory-confirmed cases of human

infection with avian influenza A(H7N9) virus, including 37 deaths [1]. Zhejiang Province is the most affected area, where 46 cases were reported.

Poultry workers are at the highest risk for A(H7N9) infection in China [2–4]. However, the retrospective serologic study provided no evidence for A(H7N9) infection in poultry workers before November 2012 in eastern China [5]. Another high-risk population is the healthcare workers who may have close contacts with patients with symptomatic or asymptomatic A(H7N9) infection. A number of healthcare workers were infected, through contacts with patients, by Middle East respiratory syndrome coronavirus (MERS-CoV), a novel human coronavirus causing outbreaks of severe acute respiratory syndrome (SARS)-like illness in Middle East and Europe, although there is no confirmed evidence of efficient human-to-human transmission of MERS-CoV, like SARS-CoV [6].

Here, we investigated the possible subclinical or asymptomatic infection with A(H7N9) virus among the healthcare workers in Zhejiang Province during the outbreak of A(H7N9) in 2013 by detecting the prevalence of anti-H7N9 antibodies in the leftover serum samples from

126 healthy healthcare workers and 615 healthy non-healthcare workers (as controls) in the cities of Taizhou, Hangzhou, and Shaoxing in Zhejiang Province, who underwent regular physical examinations between 1 April 2013 and 1 May 2013. A hemagglutination inhibition (HI) assay using guinea pig red cells and pseudoviruses expressing hemagglutinin of a representative A(H7N9) strain (A/Hangzhou/1/2013) was conducted for determining the HI titers of the serum samples, as previously described [7].

We found that none of the serum samples from the healthcare and non-healthcare workers contained H7-specific antibodies with HI titers of ≥ 20 , whereas the HI titer of the serum sample from a patient with laboratory-confirmed A(H7N9) infection was ≥ 40 . HI titers of 10 were detected in 3 of 123 serum samples (2.4%) from healthcare workers and 9 of 585 serum samples (1.5%) from the non-healthcare workers. However, there was no significant difference between these 2 groups (Table 1). No significant difference was observed between the male and female groups and among different age groups in who had HI titer ≥ 10 (Table 1).

The results suggest that none of our tested healthcare and non-healthcare

workers in Zhejiang Province may have subclinical or asymptomatic A(H7N9) infection, because none of the serum samples contains H7-specific antibodies with HI titer ≥ 20 . These results also implied that A(H7N9) might not be able to cause asymptomatic or subclinical infection. To the best of our knowledge, no case of asymptomatic A(H7N9) infections have been reported so far. This also suggests that people may be unable to acquire H7N9-specific immunity through asymptomatic or subclinical A(H7N9) infection, which may explain why people lack population immunity against A(H7N9) viruses. However, more extensive serological investigation on the asymptomatic or subclinical A(H7N9) infection among different high-risk groups at different regions should be performed.

Notes

Financial support. This work was supported by grants from the Chinese Ministry of Science and Technology, Hong Kong, Macau; Taiwan Collaborative Program (number 201200007673 to S. J.); 973 Programme of China (number 2012CB519001 to S. J.); “Chen Guang” Project of SMEC and SEDF (number 11CG03) to L. L.; and Key Lab’s 985 fund to S. J. and L. L.

Potential conflicts of interest. All authors: No reported conflicts.

All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

Table 1. Hemagglutination Inhibition Titers of Serum Samples From Healthcare Workers and Non-Healthcare Workers in Zhejiang Province, China

Characteristic	No.	Hemagglutination Inhibition Titers (%)			
		<10	10	20	≥ 40
Profession					
Healthcare workers	126	123 (97.6)	3 (2.4)	0	0
Non-healthcare workers	585	576 (98.5)	9 (1.5)	0	0
Sex					
Female	378	371 (98.1)	7 (1.9)	0	0
Male	333	328 (98.5)	5 (1.5)	0	0
Age, y					
<30	50	49 (98.0)	1 (2.0)	0	0
30–50	407	399 (98.0)	8 (2.0)	0	0
>50	254	251 (98.8)	3 (1.2)	0	0

A serum sample with a hemagglutination inhibition (HI) titer of ≥ 40 from a patient with influenza A(H7N9) infection admitted to the Shanghai Public Health Clinical Center (SHAPHC) was included as a control in the HI assay. The study was reviewed and proved by the ethics committee of SHAPHC, and written informed consent was provided to the participants.

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Clinical Infectious Diseases **2013;57(6):919–21**

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DOI: 10.1093/cid/cit396