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Letter to the Editor

Thrombohemostatic disorders in the new emerging H7N9 influenza

Dear editor,

An emerging infectious disease is usually problematic in medicine. Cross-species zoonosis is a current focus. The newly emerging H7N9 influenza infection is an atypical influenza that was detected early in 2013.¹ The disease was first reported in China and since then cases have been reported from many different provinces.¹ According to the World Health Organization official report, by the end of May 2013, there were 132 accumulated cases.² Infection can be seen in both genders and in all age groups. This disease is of concern because of the possibility that it may cause a worldwide pandemic. The H7N9 influenza virus, which seems to have originated in birds, causes problematic infections in humans.^{3,4} H7N9 influenza can display both a classic acute respiratory illness as well as many atypical clinical symptoms, including hematological disorders. Thrombohemostasis disorders are of great concern⁵ and will be discussed further in this letter to the editor.

Platelet disorders are very common laboratory findings of the new H7N9 influenza virus.⁵ Joob & Wiwanitkit were the first to call attention to this problem in their recent article published in the journal *Platelets*.⁶ According to a large report on 111 cases of infection, the finding of thrombocytopenia is common.⁷ Concerns are raised about its clinical importance. In another report, a drop in platelet counts are observed within 2 to 3 days after confirmation of H7N9 infection.⁸ H7N9 influenza virus might carry out several pathological processes to induce thrombocytopenia. Since the induction of thrombocytopenia, as a result of immunopathology, was detected in previous emerging influenza, such as the H1N1 swine flu,⁹ it could be possible to see the same in H7N9 influenza.

Focusing on the clinical importance, the main question is whether thrombocytopenia will cause bleeding or not. Up to now, there is still no report of overt bleeding as a

complication of the H7N9 influenza. Based on the available data, the decreased platelet level is small (platelet counts in reported cases are between 71 and 75 × 10⁹/L whereas the reference range is 85-303 × 10⁹/L).¹⁰ Nevertheless, whether the H7N9 can induce thrombocytopenia or not is still questionable. In fact, Lu et al. investigated four patients with one suffering from chronic hepatic schistosomiasis and a possible thrombocytopenic effect.⁸ Similarly, Chen et al. investigated four patients with one suffering from chronic hepatitis B virus infection, and a possible thrombocytopenic effect.¹¹ Thus, it is recommended to monitor the platelet count in patients infected with H7N9 influenza as it may reflect on the prognosis.

There is only one report that investigated coagulation screening in patients infected by H7N9 influenza.¹¹ The available data relates to prothrombin time (PT) and activated thromboplastin time (aPTT). According to the report by Chen et al., some cases have abnormal PT and aPTT.¹¹ The PT and aPTT are prolonged by about two and three times their normal time, respectively.¹¹ Nevertheless, Chen et al. studied only four patients and half of them had underlying medical disorders that affect coagulation (chronic hepatitis B with possible coagulation disorder and chronic rheumatic heart disease with aortic and mitral valve replacements, and receiving anticoagulant therapy). Chen et al. also reported on disseminated intravascular coagulopathy (DIC). Positive D-dimer tests can be seen in almost all infected cases.¹⁰ DIC is observed as disease progresses.¹¹

In conclusion, abnormalities in thrombohemostasis can be seen in patients infected by H7N9 influenza. It is important to monitor the thrombohemostasis in these patients.

Conflicts of interest

The author declares no conflicts of interest.

R E F E R E N C E S

1. Dai C, Jiang M. Understanding H7N9 avian flu. *BMJ*. 2013;346:f2755.
2. World Health Organization. Number of confirmed human cases of avian influenza A(H7N9) reported to WHO. Geneva; 2013. [cited 2013 Jul 21]. Available from: http://www.who.int/influenza/human_animal_interface/influenza_h7n9/08_ReportWebH7N9Number.pdf
3. Kageyama T, Fujisaki S, Takashita E, Xu H, Yamada S, Uchida Y, et al. Genetic analysis of novel avian A(H7N9) influenza viruses isolated from patients in China, February to April 2013. *Euro Surveill*. 2013;18(15):20453.
4. Goff PH, Krammer F, Hai R, Seibert CW, Margine I, García-Sastre A, et al. Induction of cross-reactive antibodies to novel H7N9 influenza virus by recombinant Newcastle disease virus expressing a North American lineage H7 subtype hemagglutinin. *J Virol*. 2013;87(14):8235-40.
5. Wiwanitkit V. H7N9 influenza-the laboratory presentations: a letter to editor. *Asian Pac J Trop Biomed*. 2013;3(7):584-5.
6. Joob B, Wiwanitkit V. Thrombocytopenia: an important presentation of new emerging H7N9 influenza. *Platelets*. 2013 Aug.
7. Gao HN, Lu HZ, Cao B, Du B, Shang H, Gan JH, et al. Clinical Findings in 111 Cases of Influenza A (H7N9) virus infection. *N Engl J Med*. 2013;368(24):2277-85.
8. Lu SH, Xi XH, Zheng YF, Cao Y, Liu XN, Lu HZ. Analysis of the clinical characteristics and treatment of two patients with avian influenza virus (H7N9). *Biosci Trends*. 2013;7(2):109-12.
9. Lee CY, Wu MC, Chen PY, Chou TY, Chan YJ. Acute immune thrombocytopenic purpura in an adolescent with 2009 novel H1N1 influenza A virus infection. *J Chin Med Assoc*. 2011;74(9):425-7.
10. Lu S, Zheng Y, Li T, Hu Y, Liu X, Xi X, et al. Clinical findings for early human cases of influenza A(H7N9) virus infection, Shanghai, China. *Emerg Infect Dis*. 2013;19(7):1142-6.
11. Chen Y, Liang W, Yang S, Wu N, Gao H, Sheng J, et al. Human infections with the emerging avian influenza A H7N9 virus from wet market poultry: clinical analysis and characterisation of viral genome. *Lancet*. 2013;381(9881):1882-3.

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