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New emerging West Africa Ebola 2014: the present global threaten

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ABSTRACT

New emerging West Africa Ebola 2014 is the present global threaten. It is a new emerging viral infection that primarily occurred in West Africa and poses the possible trend of worldwide pandemic. The 2014 West Africa Ebola outbreak is the most severe in recorded history in regards to both the number of human cases and fatalities. World Health Organization calls for global concern and attempts to stop the spread of this emerging viral infection. In this brief review, the author presents and discusses on the clinical feature of the new emerging West Africa Ebola 2014.

1. Introduction

The viral disease is usually the problem in medicine. The new emerging disease has been continuously reported in the past decade. Several new infections occur and become the great concern of the medical society. The 2014 West Africa Ebola outbreak is an ongoing epidemic of the Ebola virus disease in West Africa^[1]. The outbreak began in the Republic of Guinea in February of 2014. Since its initial outbreak, the virus has already spread to the Republic of Liberia and the Republic of Sierra Leone^[1–5]. The 2014 West Africa Ebola outbreak is believed to be the most severe in recorded medical history in regards to both the number of human cases and fatalities. A suspected 1440 cases with 826 deaths have been reported by the World Health Organization (WHO) as of 30 July 2014 (currently only 953 cases and 532 deaths have been laboratory confirmed to be Ebola)^[6]. This disease might be one of the serious problems in the world history. Wiwanitkit noted that there are three main problems of the emerging 2014 West Africa Ebola at present: a) occurrence in urban area, b) no effective diagnostic tool and treatment and c) no vaccine^[1]. Enserink

noted in Science that “Ebola drugs still stuck in lab^[3]” and this might be slower than the spreading potential of disease. With those problems, the 2014 West Africa Ebola is still the great danger and the medical personnels have to update knowledge of this emerging disease. WHO calls for global concern and attempts to stop the spread of this emerging viral infection. Crisis talks have been continuously done by health ministers in West Africa^[7]. In this brief review, the author presents and discusses on the clinical feature of the new emerging West Africa Ebola 2014.

2. Brief information on classical Ebola

The classical Ebola has been first detected for a long time. Historically, in mid–1976, new disease outbreaks were seen in Sudan and Zaire^[8,9]. The patients had a high fever, headache keypad or motorboats, blurred vision and vomiting then there would be rashes on the body later. Bleeding under the skin and bleeding from internal organs, including liver, kidney, stomach and intestinal were also observed. Those hemorrhagic problems had the effect of a shock. The patient died in a short time from onset of symptoms (until death, it usually took 4–10 d). Finally, the cause of this outbreak was successfully detected and the new virus was identified and this is the first appearance of

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Ebola virus in the world[8,9].

Virologically[8,9], Ebola virus is in family Filoviridae, which has: a) the RNA genome into a single, clear and has a length of 12.7 kb, molecular weight 4.2×10^{-6} , no poly(A) at the 3' viral particles contain proteins, b) 7 enzymes including transcriptase, which act on creating a sequence-mRNA, c) nucleocapsid spiral staircase (helical) with a diameter of 80 nm and length 800–1000 nm, enclosed membrane lipids (envelope) with a stem extending peplomer and d) shaped in many ways including long lines or circular-shaped contours. The virus can be destroyed by lipid solvents/UV/gamma/formaldehyde 1%/beta-pro oak lactone/acetic 3%/a compound disinfectant phenolic/matrix hypochlorite chloride. At room temperature, the virus can trigger infections in several days, but will be destroyed at 60 °C in a 30–minutes period. There are 2 subtypes of Ebola virus including Sudan subtype (Ebola-S) and Zaire subtype (Ebola-Z). The virus can cause an infection in multiple organ systems (pantropic), but the most common affected organs are liver and spleen, where the virus is to stop for development and increase in number.

A 2–21 days incubation period is noted. After incubation, a viral-like illness will develop. A fatal syndrome will occur. Martínez and Ramírez Ronda noted that “as days go by, symptoms worsen, and by the 7th day, a severe and diffuse bleeding tendency ensues[10]” and “the individual's death is the most likely outcome in the great majority of cases[10].” To diagnose Ebola virus, which is a deadly serious pathogens, WHO mentions for the requirement of bio-safety level 4 medical laboratory. Definitive diagnosis can be by antigen detection in tissues from various organs. Using specific antibodies from immune fluorescence staining method can also be an alternative technique[11]. Detection of the genome of the virus by RT-PCR or detection of viral particles by electron microscopy are the reference diagnostic techniques[11].

The interesting question is why the disease is too serious. The main clinical features of the disease that lead to high mortality include: a) the virus firstly and mainly attack lymphoid organ as spleen and this result in immunodeficiency state and b) the virus attach vascular system, as a pattern of viral hemorrhagic disease.

3. The 2014 West Africa Ebola outbreak

As noted, the 2014 West Africa Ebola outbreak is of concern at present. This disease becomes a big news when its rapidly expands in Africa and the medical personnels get infected and result in death[12–14]. Changula *et al.* noted that “there has been an increase in the incidence of filovirus hemorrhagic fever outbreaks in Africa in the last two decades, with some caused by a newly found virus and some occurring in previously unaffected areas such as Guinea, Liberia and Sierra Leone, which suffered the most recent Ebola virus disease outbreak in 2014[13].” Dixon *et al.* concluded the present situation that “On March 21, 2014, the Guinea Ministry of Health reported the outbreak of an illness characterized by fever, severe diarrhea, vomiting, and a high case-fatality rate (59%) among 49 persons[15]. Specimens from 15 of 20 persons tested at Institut Pasteur in Lyon, France, were positive for an Ebola virus by PCR[15].” Guinea, Liberia and Sierra Leone are already affected. “An outlier strain of

Zaire subtype Ebola virus” is identified as the problematic pathogen for the present 2014 West Africa Ebola outbreak. Gatherer noted that “the full geographical extent and degree of severity of the outbreak, its zoonotic origins and its possible spread to other continents are sure to be subjects of intensive discussion over the next months[16].” The great concern on the newly detected mutated virus is its property. The present question includes whether it will be the new virus that can be air-borne transmitted. If the answer is yes, we are facing the actual greatest outbreak in the medical history since it combined the severity as hemorrhagic disease, immunosuppression as immunodeficiency virus and contagiousness as air-borne disease (like combining hemorrhagic fever with AIDS with new emerging influenza).

Conflict of interest statement

I declare that I have no conflict of interest.

References

- [1] Wiwanitkit V. Unprecedented scale Ebola epidemic in Guinea: what we should know. *Asian Pac J Trop Biomed* 2014; 4(Suppl 2): S571.
- [2] Bausch DG, Schwarz L. Outbreak of ebola virus disease in Guinea: where ecology meets economy. *PLoS Negl Trop Dis* 2014; 8(7): e3056.
- [3] Enserink M. Infectious diseases. Ebola drugs still stuck in lab. *Science* 2014; 345(6195): 364–365.
- [4] Green A. Ebola emergency meeting establishes new control centre. *Lancet* 2014; 384(9938): 118.
- [5] Ansumana R, Bonwitt J, Stenger DA, Jacobsen KH. Ebola in Sierra Leone: a call for action. *Lancet* 2014; 384(9940): 303.
- [6] Wikipedia. 2014 West Africa Ebola outbreak. San Francisco: Wikipedia; 2014. [Online] Available from: http://en.wikipedia.org/wiki/2014_West_Africa_Ebola_outbreak [Accessed on 5th August, 2014]
- [7] Gulland A. Health ministers in west Africa hold crisis talks on Ebola virus. *BMJ* 2014; 348: g4478.
- [8] Ebola haemorrhagic fever in Sudan, 1976. Report of a WHO/International Study Team. *Bull World Health Organ* 1978; 56(2): 247–270.
- [9] Ebola haemorrhagic fever in Zaire, 1976. *Bull World Health Organ* 1978; 56(2): 271–293.
- [10] Martínez GA, Ramírez Ronda CH. [Ebola: “a fatal syndrome”]. *Bol Asoc Med P R* 1996; 88(7–9): 69–72. Spanish.
- [11] Hartman AL, Towner JS, Nichol ST. Ebola and marburg hemorrhagic fever. *Clin Lab Med* 2010; 30(1): 161–177.
- [12] Torjesen I. Two doctors die from Ebola and lives of others under threat in West Africa. *BMJ* 2014; 349: g4895.
- [13] Changula K, Kajihara M, Mweene AS, Takada A. Ebola and Marburg virus diseases in Africa: increased risk of outbreaks in previously unaffected areas? *Microbiol Immunol* 2014; doi: 10.1111/1348-0421.12181.
- [14] Adalja AA. Ebola in west Africa: a familiar pattern? *Biosecur Bioterror* 2014; 12(4): 161–162.
- [15] Dixon MG, Schafer IJ, EIS officer, CDC. Ebola viral disease outbreak—west Africa, 2014. *MMWR Morb Mortal Wkly Rep* 2014; 63(25): 548–551.
- [16] Gatherer D. The 2014 Ebola virus disease outbreak in West Africa. *J Gen Virol* 2014; 95(Pt 8): 1619–1624.