

PACIFIC JOURNAL OF MEDICAL SCIENCES

{Formerly: Medical Sciences Bulletin}

ISSN: 2072 – 1625



Pac. J. Med. Sci. (PJMS)

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EBOLA VIRUS DISEASE: AN OVERVIEW

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Submitted: December 2014, Accepted: January 2014

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The Ebola virus (EBV) was first identified in 1976 when there were two outbreaks, one in Sudan and one in the Democratic Republic of Congo (DRC), in a village near the Ebola River [1]. EBV is a member of the virus family Filoviridae, which includes the Cuevavirus, Marburgvirus and Ebolavirus genera. Within the Ebola virus genera there are 5 species, Zaire, Bunibugyo, Sudan, Reston and Tai forest [1]. The viruses in this and other zoonotic families have emerged onto the human scene following major environmental changes such as large scale animal husbandry, extraction of natural resources, deforestation, and the use of antimicrobials [2].

The current Ebola outbreak in West Africa, caused by Ebola Zaire is the largest ever reported; beginning in early 2014 and as of the end of November 2014 known to have claimed close to 7000 lives [3]. By early January almost 21000 cases have been reported with the loss of

more than 8000 lives (4). Starting in Guinea, Ebola has crossed land borders into Sierra Leone and Liberia, and on a very much smaller scale has travelled by air and sea to other African countries and to America and Europe where sensational media coverage has produced widespread fear of epidemics [5].

Ebola is a zoonotic infection. It is believed that the primary host is the fruit bat (or possibly other bat species) but that the virus spreads to other animals such as non-human, primates, forest antelope and porcupines. The virus is transmitted to humans by close contact with blood, secretions, bodily fluids or organs of infected animals. Human to human transmission is by direct contact with blood, secretions, organs or other bodily fluids of infected people either directly or from contaminated surfaces and materials such as clothing and bedding [1]. The virus is highly infectious. The incubation period is

from 2 - 21 days, and humans only become infectious when they develop symptoms. In a study of 3343 confirmed and 667 probable Ebola cases from the current epidemic researchers estimated a mean incubation period of 11.4 days with a mortality of 71.0% in those with known clinical outcome [6]. Mortality of hospitalised patients is currently reported at around 60% (4). Characteristic early symptoms are fever, fatigue, headache, sore throat and muscle pains, progressing to diarrhoea, vomiting, skin rash and impaired renal and liver function. In some, but not all cases there is internal and external bleeding (the original name of the disease was Ebola Haemorrhagic Disease). As a result of its high infectivity and its mode of spread, Ebola thrives in situations in which basic hygiene and understanding of disease spread is poor, where health services are inadequate, and in situations where local custom decrees close contact with severely ill and deceased patients. All of these factors have fuelled the current epidemic.

In the early stages Ebola presents in a similar way to other common febrile illnesses. Diagnosis requires laboratory testing (usually by PCR) and there is often delay between suspecting and confirming a diagnosis. It has recently been reported that the meantime between symptom onset and diagnosis is around five days- during which the patient is highly infectious [6]. Blood for laboratory testing is a major biohazard, and must be handled in facilities with appropriate safety level. Point of care diagnostic testing currently being developed would be likely to reduce the

time from symptoms to diagnosis and the immediate application of isolation would greatly reduce the attack rate of the disease [7].

There is currently no antiviral treatment available, although trials of three treatment regimens- two with anti-viral agents and one with convalescent whole blood and plasma –were scheduled before the end of 2014 [8]. Survival rates can be improved by early focussed supportive care such as rehydration. Such care does however put the carer at major risk and requires the use of uncomfortable full personal protective equipment (face protection, clean, long sleeved gown gloves and hood. It is sobering to realise that so far of 820 health workers known to have been infected 488 have died, their deaths being attributed to shortage and improper use of personal protective equipment and lack of training [4].

There are currently no licenced Ebola vaccines, although potential vaccines are undergoing safety trials and may become available in the foreseeable future. Currently, prevention and control depends on the application of highly effective but often challenging measures. Risk reduction measures include [1]:

- reducing the risk of wildlife to human transmission by avoiding unprotected contact with potentially infected animal sources, and ensuring that meat and animal products are thoroughly cooked before consumption,

- reducing the risk of human to human transmission by stringent hand washing when caring for, or visiting any sick patients and the use of appropriate personal protective equipment when caring for Ebola patients, and outbreak control measures,
- outbreak containment by identifying and monitoring the health of contacts of a patient for 21 days, separating those who are sick from those who are asymptomatic, prompt and safe burial of the dead, and application of scrupulous hygiene measures.

Good case management, active surveillance, a good laboratory service and social mobilisation and involvement are crucial.

Is Papua New Guinea at risk of an outbreak of Ebola?

The risks of an outbreak in Papua New Guinea (PNG) are extremely small. This does not mean there is no need for preparedness but it does mean common sense should prevail. Most of the high risk West African population are at the lower end of the socioeconomic scale and unlikely to embark on long distance international air travel. Most cases reported from America and Europe have been health workers or missionaries who have been in close contact with Ebola patients. There is very little travel of people from West

Africa to the South Pacific region and particularly to Papua New Guinea, so the risk of importation is minimal. It is pertinent however for health workers to be aware of Ebola and should any person recently arrived from West Africa develop the early symptoms, the Health Department should be notified immediately and appropriate measures taken.

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