

Joint UKBTS Professional Advisory Committee (¹)

Position Statement

Ebola Virus

March 2020

Approved by: Standing Advisory Committee on Transfusion Transmitted Infections

March 2020 - The contents of this document are believed to be current. Please continue to refer to the website for in-date versions.

Background

Ebola virus (EBOV) is one a group of viruses that cause viral haemorrhagic fever. It was first identified in 1976 in what is now the Democratic Republic of the Congo. The associated illness is referred to as Ebola virus disease (EVD).

EVD is a serious acute illness. The average case fatality rate is approximately 50% but may vary from 25-90% depending on the level of available supportive care, the patient's immune response, and the particular strain of Ebola virus in question.

EVD is a zoonosis. Humans are not the natural reservoir for any of the haemorrhagic viruses, and although not yet proven, fruit bats are thought to be the natural Ebola virus hosts. Transmission of Ebola virus from animal reservoirs to humans is uncommon however, an increase in the number of outbreaks of EVD in the last 20 years is likely due to the closer proximity of human habitats to Ebola reservoirs as well as deforestation and climate change. The exact mechanism of EBOV spill over from animals to humans has not been elucidated, but once this has occurred inter-human transmission is through direct (or indirect e.g. soiled bedding) contact with the blood and body fluids of an infected individual. The virus is geographically restricted to the endemic areas where its host species reside. Occasional cases have been reported outside Africa – these are usually healthcare/laboratory acquired or associated infections.

Since 1976 there have been over 20 recorded outbreaks of EVD, mainly in Central Africa (Democratic Republic of the Congo 2018, 2017, 2014, 2012), Uganda (2011, 2012), Republic of Congo (2005), Sudan (2004). The most recent outbreak in the DRC constitutes an international public health emergency. As of March 2020, there have been 3444 cases reported with 2264 deaths and no new cases of Ebola virus disease reported since 17 February 2020.

Outbreaks generally occur sporadically and irregularly and cannot be predicted. Earlier outbreaks were largely contained and controlled because they occurred either in less populated areas where isolation of infected individuals was possible or for individual cases imported into countries with developed healthcare systems, full isolation of the patients was possible. The West African EVD outbreak in 2014-15 however, which centred on Sierra Leone, Guinea and Liberia, has been the largest outbreak to date, with 28 000 cases and 11 000 deaths. The global response, providing multi-national support and intervention ultimately brought an end to the epidemic and provided further insights into EVD.

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Modes of Transmission

Although transfusion-transmission is theoretically possible, at this time there have not been any reports of cases in affected countries. It is assumed an infected and infectious donor would be symptomatic and thus unlikely to donate, however, asymptomatic infections have been described. Depending on the assay used and the extent of exposure EBOV IgG has been detected in 2.5% - 45.9% of contacts in seroprevalence studies. Transmission is seen frequently within families, within hospitals, and during some mortuary rituals where contact among individuals becomes more likely. Exposure to infected patients and their body fluids puts healthcare workers at a high risk of infection unless appropriate procedures are followed. Although only a few cases of sexual transmission have been reported, Ebola virus nucleic acid has been found to persist in semen for over a year after recovery from EVD, and is an important mode of transmission in the convalescent period. Indeed, transmission of EBOV due to persistence in body fluids such as semen, has recently been described as a cause of 'flare-ups' and clusters of EVD in regions where active transmission was thought to have ceased. Of importance, recrudescence and relapse of infection due to persistence of EBOV RNA at immune-privileged sites (e.g. the central nervous system) has been described. Furthermore, recent studies have shown serological evidence of reactivation in one-third to one-half of recovered individuals. The implication for onward transmission under these circumstances is unclear. Transmission through food (with the possible exception of bush meat) and water does not occur. Outside of controlled laboratory experiments, spread of Ebola via aerosols is very rare.

Management of EVD

EVD is mostly managed with good supportive care. The results of clinical trials evaluating potential vaccines (e.g. rVXV-ZEBOV) have shown promising results in terms of safety and efficacy. 'Ervebo' vaccine(manufactured by Merck) has been given to more than 250 000 high-risk individuals since the beginning of the DRC outbreak, and has recently been granted marketing authorisation by the European Commission. The vaccine is also approved by the FDA. ZMapp is commonly prescribed in the management of EVD. More recently MAb114 and REGN-EB3 demonstrated superiority to ZMapp with respect to mortality in the PALM Clinical trial.

Although countries with Ebola virus outbreaks are generally not major tourist destinations, travel to and within these countries does occur, and there may be some migration to the UK and other European countries. Ebola virus outbreaks, excepting any potential person to person transmission in a healthcare setting when an infected individual has been moved to a non-affected country for treatment, have been identified only in countries that are also malarious. Therefore, all individuals who have been in affected areas will be excluded from blood or tissue donation for four months after their return to the UK under current UK donor/donation malaria guidelines. Individuals who have ever been infected with Ebola virus

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are permanently excluded from donating, with the exception of those who are donating immune (convalescent) plasma for therapeutic use on patients with EVD. Potential blood donors who are contacts of those who have been infected with Ebola will be excluded for six months from last contact. Data to suggest that EBOV can be found in privileged sites in survivors and which could potentially lead to EVD transmission resulted in the Advisory Committee for Dangerous Pathogens (ACDP) updating their EBOV guidance. In response SaBTO updated guidance for deferral of potential tissue and cell donors who had been in contact with an infected individual, was under investigation for EBOV or who has been in contact with an individual that was present in an area during an active outbreak, implementing a precautionary permanent deferral.

Ebola serology could be useful to identify risk (asymptomatic individuals who could present as donors and sexual contacts of asymptomatic individuals) although the current issue is finding reliable CE-marked Ebola serology assays. Only infected individuals who had been viraemic (symptomatic or asymptomatic) would have virus in immune-privileged sites, and if viraemic the individual would become sero-positive. Due to the introduction of vaccines in high-risk populations, serological assays would need to distinguish vaccinated from naturally immune individuals.

Convalescent (immune) plasma

As with many viral infections, those who recover from EVD develop antibodies which then may confer a degree of protection against further exposure to Ebola virus. One of the Ebola treatment approaches has been the infusion of plasma from recently infected and recovered individuals: convalescent or immune plasma. In theory, the antibodies present in the plasma would neutralise virus circulating in an infected individual, helping to reduce viral load and consequently reduce the load on the individual's immune system, with the overall aim of helping to ensure recovery. Individuals who have been laboratory proven to have been recently infected and recovered from EVD may be eligible to donate immune/convalescent plasma for use in the treatment of individuals with EVD.

Countries affected by Ebola virus are shown in the Geographical Disease Risk Index (GDRI) and any associated Change Notifications.

(¹) Joint United Kingdom Blood Transfusion and Tissue Transplantation Services Professional Advisory Committee (JPAC)