PRIMEVIEW

EBOLA VIRUS DISEASE

nature reviews disease primers

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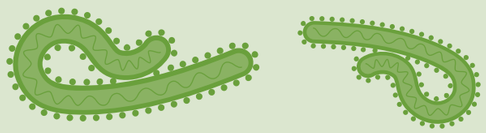
Ebola virus disease (EVD) is a severe infectious disease with an average case–fatality rate of >40%. EVD is caused by the filovirus Ebola virus (EBOV).

EPIDEMIOLOGY

All EVD outbreaks have originated in Africa, with occasional exported cases to the USA and some European countries. Oubreaks affected only tens or hundreds of individuals until the largest outbreak to date broke out in 2013 in Guinea (where EVD had never occurred before). The Western African epidemic lasted for 3 years and involved 15 countries and ~29,000 people. Phylogenetic studies showed extensive back-and-forth movement of EBOV across borders.



! The second-largest EVD outbreak started in the Democratic Republic of the Congo in 2018 and is still ongoing, with >3,000 cases so far

MANAGEMENT

No specific anti-EBOV medical countermeasures have been approved, but...

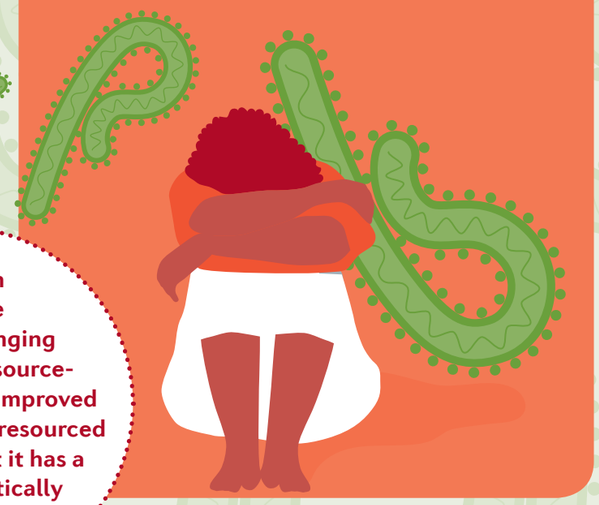
...the PALM randomized controlled trial identified a survival benefit with two monoclonal antibody-based therapeutics in the Democratic Republic of the Congo

Supportive care for acute EVD includes replacing fluid losses, correcting electrolyte imbalances and low blood sugar, preventing and treating co-infections and providing adequate nutrition

Although intensive care is challenging to deliver in resource-limited settings, improved outcomes in well-resourced settings suggest it has a key role in critically ill patients

QUALITY OF LIFE

Many survivors of EVD experience physical sequelae — such as fatigue, joint pain and uveitis — that substantially impair their quality of life and ability to work for years. In addition, mental health issues — such as depression and post-traumatic stress disorder — are common among survivors and are compounded by stigma from their community. Viral persistence in immuno-privileged sites is associated with risk of recrudescence and, in male survivors, risk of sexual transmission.



MECHANISMS

The first case in an outbreak is typically a zoonotic transmission event from an EBOV natural host, although the identity of the host is unconfirmed. Human-to-human transmission occurs via direct contact or contact with infected bodily fluids or contaminated fomites. Macrophages and dendritic cells are the primary targets of the virus. Infected cells transport EBOV to the lymph nodes, from which the virus spreads to distant organs, eventually leading to multiple organ dysfunction syndrome.

DIAGNOSIS

The initial non-specific manifestations (including fever and muscle pain) quickly progress to severe gastrointestinal symptoms and signs (nausea, vomiting and high-volume diarrhoea). In the peak phase, dehydration, hypotension and dysregulated inflammation can lead to renal, hepatic and respiratory failure, and some patients also develop haemorrhagic and neurological complications.

PREVENTION

Isolation of individuals with suspected or confirmed EVD and ring vaccination of their contacts are crucial to stop transmission. A live-attenuated recombinant vesiculovirus candidate vaccine is being used to contain the current outbreak and is approved by the US Food and Drug Administration and the European Commission.

OUTLOOK

Although much progress still needs to be made in every aspect of EVD, the 2013–2016 Western African epidemic has considerably helped to shape the response strategies that are now applied in the field. These strategies include preventive measures (such as ring vaccination) and the administration of supportive care and specific therapeutics. Importantly, support for the outbreak responders from the local populations is vital for successful disease control, and efforts to engage the local communities must be prioritized.

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