Medical Briefings

Updated 1st August, 2014

Ebola Virus Disease Update

The outbreak of Ebola Virus Disease continues in Guinea, Liberia and Sierra Leone. The WHO have recently characterised the epidemic in Liberia and Sierra Leone as 'precarious' with high numbers of new infections and fatalities occurring. The total number of cases has now risen to 1,323 with 729 fatalities. A multi-national coalition of experts from countries including the UK, France, Germany and the USA, is providing technical knowledge and support to the affected countries as well as the WHO and partners implementing mobile field laboratories for early confirmation of infected individuals. Nigeria's reported first case of Ebola, in a 40 year old Liberian national who had recently arrived by airplane, has prompted contingency planning by several countries including the UK.

The Ebola virus is a rare infection which has caused several epidemics in Central and West Africa. Described after the Ebola River in the Democratic Republic of Congo, which was the site of an early outbreak, this virus is able to cause disease by its ability to disorganise and deplete our immune response, leading to the failure of many systems in the body.

The fruit bat is thought to be the natural host of the Ebola virus but it has also been found in animals which the bat has infected. These include monkeys, apes, pigs, forest antelopes and porcupines. Humans have been infected by being involved with the slaughter of any of these animals, the ingestion of their blood or milk, or by eating raw or undercooked meat. Human to human transmission can then occur by people coming into contact with blood, secretions or bodily fluids of infected individuals.

As there is no specific treatment for this serious illness and outbreaks have often occurred in remote locations, where medical provision is very poor, the fatality rate can be up to 90%.

What are the symptoms?

Like many viral illnesses the initial symptoms are those of fever, lethargy and muscle ache. These symptoms usually occur from 2 to 21 days after being infected. The virus spreads by infecting certain white blood cells which carry it in the blood to more distant parts of the body, causing further symptoms. For example, in the gut diarrhoea and abdominal pain can occur, shortness of breath can follow when the respiratory system is affected, whereas in the brain confusion or even coma results.

The severe illness which occurs from this multi-system involvement often results in death in only 6 to 16 days.

The virus releases proteins into the blood which not only destroy our immune defences but cause so much inflammation that our clotting system is overwhelmed.

Uncontrolled bleeding can then result which causes internal and external haemorrhaging giving rise to the former name of this disease:

'Ebola Haemorrhagic Fever'

Countries directly affected by Ebola

Current Outbreak:

- Guinea – 460 cases
- Liberia – 329 cases
- Nigeria – 1 case
- Sierra Leone – 533 cases

Previous Outbreaks

- Congo
- Cote d'Ivoire
- DRC
- Gabon
- Sudan
- Uganda

Diagnosis

Diagnosis is possible but difficult as it depends upon specialised blood tests which may not be available at the site of the outbreak. Even taking the blood specimen and performing the appropriate tests is hazardous, as healthcare workers and laboratory staff are at risk of infection from the blood.

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Treatment

There is as yet no specific treatment for Ebola Virus Disease. The only possible therapeutic approach is to support the patient whilst their own immune system combats the infection. This is best done in an intensive care unit setting, where machines can aid lung and kidney function for example. Such a unit must be equipped with specialised devices to protect the medical staff from the infection themselves – there are few such facilities in Africa, however.

As the outlook for an infected individual is bleak, healthcare professionals have utilised isolation practices to limit further infections whilst offering what support they can to the patients in the field.

By far the best approach is to avoid infection in the first place but consideration should also be taken to prevent diseases which might be mistaken for Ebola, especially as the symptoms in the early stage of the disease are common to several infections. Malaria prevention is particularly important as are hand-washing and ensuring food and water safety.

What precautions can I take?

- Avoid contact with:
  - symptomatic patients and corpses – post-mortem infection has been described
  - close contact with live or dead wild animals.
- Avoid consumption of bush meat.
- Wash and peel fruit and vegetables.
- Prepare and cook meat thoroughly.
- Practise hand-washing.
- Practise safer sex – Ebola virus is found in all bodily fluids.
- Take precautions to avoid illnesses which may be confused with Ebola:
  - take anti-malarials and use mosquito bite prevention strategies.

Travellers who develop viral symptoms within 21 days of returning from an affected country should seek medical attention, detailing their travel history.

The future

Vaccine studies are being performed to assess not only if some protection can be gained *prior* to infection but also whether a vaccine could improve the immune system *after* being infected. As Ebola infection is often fatal to humans, animal studies have been used to test whether candidate vaccines offer protection against the virus. One promising approach which has produced successful results in monkeys, has been to combine a common cold virus (human adenovirus) with parts of the Ebola virus. There is no viable human vaccine at present, however.

Key points

- Ebola is a rare, very serious viral illness.
- There is a current outbreak in West Africa.
- The chances of acquiring Ebola are very low.
- There is no specific treatment.
- Precautions to avoid infection can be taken.
- No travel plans need be changed at present.

Further Reading

WHO - http://www.who.int/csr/don/2014_07_10_ebola/en/

NaTHNac - http://www.nathnac.org/pro/clinical_updates/ebola_westafrica_030714.htm

Research Paper
Ebola Haemorrhagic Fever. H Feldmann and TW Geisbert. Lancet. (2011), 377 (9768): 849-862.

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