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RESEARCH ARTICLE

EBOLA VIRUS- DEADLY THREAD TO PREGNANCY

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ABSTRACT

Ebola virus is a acute viral syndrome come with lots of defect and problems. It is one of the deadly disease to mankind moreover it is more fetal to pregnant women's it get easily transmitted between humans to humans and cause infection. Knowledge related to it must be given. So the main aim of this paper is to make awareness regarding this virus and how it can be dangerous to mankind. As Ebola virus is dangerous it has 4 species which cause sever damage to humans. Ebola virus transmission is too very fast as discussed and it cause a lot of signs and symptom and these signs should never be neglected. Family planning, Pregnancy, Delivery time, should be done with great care as it target to pregnancy too and management of pregnant women should be done properly.

Key words: Ebola, Pregnancy, Filoviridae, Maternal, Motility, Transmission, Pregnant.

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INTRODUCTION

The new fatal diseases are being continuously reported in the past decade (Wiwanitkit, 2014). Ebola virus disease is a zoonotic disease transmitted accidentally by direct contact with infected live or dead animals. Ebola virus is an acute viral syndrome with fever and subsequent bleeding diathesis marked by high mortality in human and non-human primates (monkeys, gorillas and chimpanzees). Ebola virus is a violent pathogen, a lipid-enveloped negatively stranded RNA virus that belongs to the viral family *Filoviridae* (World Health Organization, 1999).The first Ebola virus disease (EVD) outbreak occurred at same time in Nzara, Sudan in which 151 people died out of 281 patients (Report of a WHO/International Study Team, 1978) and in Yambuku, Zaire (Democratic Republic of Congo) in which 280 persons died out of 318 patients in 1976. The Ebola Virus disease got its name from the Ebola River, which passes near the Yambuku village where the outbreak of this disease firstly occurred (Report of an International Commission, 1978). The first case of the current EVD outbreak in West Africa was reported in Guinea in March 2014 (Johnson *et al*., 1977). The earliest rise of the outbreak appears to be occur in a tiny village called Meliandou in southern Guinea where an index-case, a two-year old boy name Emille suffered a haemorrhagic fever and died on 6th December 2013 (Baize *et al*., 2014).

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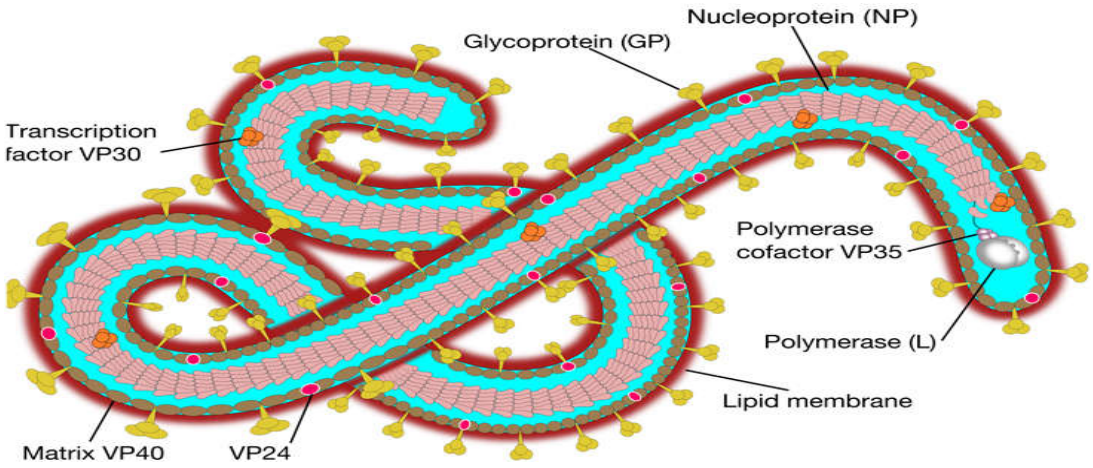
On March 23, 2014 the World Health Organization (WHO) notified of an outbreak of EVD in Guinea (Gatherer, 2014) and from there it spread to Liberia and Sierra Leone (across land borders) and by land travel to Senegal and by air travel to Nigeria (WHO, 2014; Camacho *et al*., 2014). Ebola virus current outbreak in West Africa can be described as most severe public health emergency in modern times (Ebola Virus Disease, 2014). The primary symptoms that can show in Ebola infected person are headache, fever, diarrhoea, vomiting, sore throat, fatigue, muscle pain, abdominal pain, cough, anorexia, nausea, etc. This article is focused on the effect of Ebola virus in pregnant patient; an infected pregnant woman is unlikely to be an isolated occurrence but part of a wider outbreak with generalised transmission within the community. As the current outbreak has evolved reflection, evaluation and adaptation of control strategies have resulted in increasing knowledge and experience with this previously neglected disease. This is specially the case for the management of the infected pregnant woman, with much of what is now practised resulting from field experience and ongoing multi-professional discussions (West, 2014; Hayden, 2015).

VIROLOGY

Ebola virus (EVD) and Marburg Virus (MARV) belong to the *Filoviridae* family, Order Mononegavirales. These are characterized by having a filamentous morphology (Maganga *et al*., 2014; Kiley *et al*., 1982).



VP: virion protein; GP: glycoprotein.

Figure 1. Schematic representation of the Ebola virus

Ebolavirus is zoonotic filovirus, comprised of envelope, non-segmented negative-stranded RNA. The gene products of Ebola and Marburg viruses illustrate a noteworthy degree of similarity and in some areas extended identity, but are encoded in conflicting nucleotide sequences (Feldmann *et al*., 2011; Leroy, 2005).

The genus Ebolavirus includes five species

- Ebola virus (EBOV) or Zaire ebolavirus
- Sudan ebolavirus (SUDV)
- Taï Forest ebolavirus (TAFV)
- 4.Reston virus (RESTV)
- Bundibugyo ebolavirus (BDBV) (Leroy *et al*., 2014)

Four species have been known to cause disease in humans

- The ZaireEbolavirus has been causing large EVD outbreaks in Central Africa. The Ebola outbreak in the year 2014-15 in West Africa was caused by this species of Ebola virus.It was first reported in the year 1976 (Kuhn, ?; WHO, 2014; Georges *et al*., 1997; Johnson *et al*., 1977). **ii.)** The Sudan virus whose first and second outbreak were reported in 1970s, the third outbreak occurred in Uganda in the year 2000 with the fourth and last one to be reported in Sudan again in the year 2004. The mortality rates have been documented as being at 50% for the four outbreaks (Baize *et al*., 2014; Ebola haemorrhagic fever in Sudan, 1976; Baron *et al*., 1983; Centers for Disease Control and Prevention, 2001; Sanchez *et al*., 2014). The name Sudan virus is derived from South Sudan (where it was first discovered before South Sudan seceded from Sudan) (Onyango *et al*., 2007).
- The Ivory Coast virus (also known as Taï forest virus)has caused diseaseonly in one person who ended up surviving (Kuhn *et al*., 2010). It was first described in 1995 as a new "strain" of Ebola virus (Formenty *et al*., 1999). The name Taï Forest virus got its name from the "parc National de Taï(the name of a national park in Côte d'Ivoire, where it was first discovered) (le Guenno *et al*., 1995).
- The Bundibugyo virus had a lower mortality rate of 30%. The genomic sequences reveal that the virus has close relations with the Ivory Coast species. Its first emergence was in 2007 in Uganda (Kuhn *et al*., 2010).This virus got its name from the city Bundibugyo (city of the Ugandan Bundibugyo District) wherever it first discovered (Towner *et al*., 2008).

EPIDEMIOLOGY

The obstruction of Ebola virus disease in pregnant women remains unsure due to the low numbers of patients affected in previous outbreaks and limitations in data collection during the current outbreak. In particular numbers and rates of infected pregnant women and accurate survival rates are not yet available. However, in the two previously published case series, the estimated case fatality ratio (CFR) was approximately 90% (Kuhn *et al*., 2010; World Health Organization, 1978). While this has widely been used as a maternal mortality estimate, unpublished data from the current outbreak collected by Me´decins sans Frontie`res (MSF) would suggest that the CFR is lower. The same case series reported a zero perinatal survival rate with all pregnancies ending in spontaneous miscarriage, stillbirth or neonatal death. The same observation has been made in all outbreaks, and so far in this epidemic there is no recorded case of a baby, born to an infected mother, surviving more than a few days (Mupapa *et al*., 2013).

PATHOGENESIS

The pathological process of Ebola Virus in humans remains poorly understood however shows similarities, variations and different causes of viral haemorrhagic fever or bacterial sepsis. End-organ disability appears to result from a combination of a direct viral cytopathic effect, the host immune response, and from under-resuscitated hypovolemic shock (World Health Organisation, 2013; Bah, 2015). EBOV binds to lectins and other surface receptors, with monocytes, macrophages, and dendritic cells as targets. These virus-containing cells spread through the lymphatic system, liver, and spleen, resulting in a widely disseminated viral infection. Endothelial cell infection and activation may lead to increased levels of soluble adhesion molecules, thombomodulin, and inflammatory mediators such as interferon-gamma and -alpha, interleukins (IL)-2, 6, and 10, interferon-inducible proteins, and tumour necrosis factor alpha, resulting in vascular injury.

Thrombocytopenia, consumption, and reduced production of clotting factors, in addition to increased concentrations of fibrin degradation products in patients with severe EVD, may contribute to bleeding. Hepatocellular inflammation is common, and myositis with elevations of creatine kinase and pancreatitis (elevated blood amylase and lipase levels) occurs in severe cases. While acute kidney injury can often be explained by under-resuscitated hypovolemia, it might also arise from viral or secondary bacterial sepsis, acute tubular necrosis, myoglobinuria, and micro vascular renal thrombi associated with sepsis or disseminated intravascular coagulation (Schieffelin *et al*., 2014; McElroy *et al*., 2014). Adrenal gland viral infection has been shown in animal models and might contribute to hypotension, renal sodium loss, and hypovolemia (McElroy *et al*., 2014).

Symptoms

The symptoms can appear anywhere between 2–21 days (Fletcher, 2014). The primary symptoms of Ebola virus disease include sore throat, fever, fatigue, muscle pain which are followed by rash, abdominal pain, cough, anorexia, nausea, diarrhoea, vomiting, shortness of breath, postural hypertension, edema, headache, confusion, and coma (Ebola Virus Disease Signs and Symptoms, 2014). In some cases, a maculopapular rash develops after 5–7 days of infections (Hoenen *et al*., 2006). In severe cases, the patient also develops haemorrhagic complications (such as mucosal haemorrhages, nose bleeding, vomiting/coughing up blood, blood in stool, petechiae, ecchymoses, uncontrollable bleeding from venepuncture sites), severe metabolic disturbances, convulsion, shock, and multiple organ failure. These complications are the major causes of death in patients (Ebola Virus Disease Signs and Symptoms, 2014). Gastrointestinal symptoms are the most common in the current outbreak (Goeijenbier *et al*., 2014).

Transmission

The natural reservoirs of Ebola virus are concern to be fruit bats of Pteropodidae families (Leroy *et al*., 2005). Human species can be contaminated by Ebola virus by direct contact with blood and body fluids of infected animals like apes, gorillas, fruit bats, and monkeys (Ebola Virus Disease, 2014; Transmission, 2014; Leroy *et al*., 2014). The transmission of Ebola virus from Human-to-human takes place via direct connection with the blood, organs, secretion, and other body fluids (breast milk, mucus, vomit, urine, faeces, semen) of an infected person and via surface and materials contaminated with these fluids (Ebola Virus Disease, 2014; Wamala *et al*., 2010; Chowell, 2014; Bausch *et al*., 2017). Contaminated syringes and needles are the different means by which the virus can be transmitted from an infected person to a healthy person. The Ebola virus does not spread through air or water. There is no proof available that pet cat and dogs, mosquitoes, or other insects can convey Ebola virus (Transmission, 2014).

Ebola virus and pregnancy

Knowledge of anything about Ebola virus disease in pregnancy arrives from previous outbreaks of Ebola virus disease (EVD) in Africa. There are no proofs from those outbreaks to intimate that pregnant women are more sensitive to Ebola virus disease. The limited evidence from those outbreaks suggests that probability of critical illness, complications and death increased to infected pregnant women. Reported complication includes spontaneous abortionand maternity-related haemorrhage. Babies, born to mothers who are in the terminal stage of disease are consistently infected, with higher neonatal mortality rates reported (Jamieson *et al*., 2014; Finnegan *et al*., 2014; Howard, 2005).

Delivery

All deliveries (at any gestation and whether during or after illness) out to occur inside a high-risk area. Within the EMC there should be a designated area for maternity that provides both good access for the health-care staff and privacy for the woman. Intravenous access should be gained at the earliest time, ideally prior to labour. This is to reduce the need to perform procedures on a potentially distressed patient, under stressful circumstances or in a haemorrhaging patient wherever blood vessel access is alsotroublesome. Fatal monitoring is not needed throughout labour as obstetrical interventions are not suggested for suspected fatal distress. Surgical delivery for the sake of the foetus is probably going to be futile, given the chance of neonatal death; this would also be of particularly high risk to the health-care suppliers. Wherever surgery is considered for maternal reasons, a multi-disciplinary team should decide on the risks versus benefit ratio, ideally consulting with a medical ethical opinion (www.rcog.org.uk/globalassets/documents/news/ebola-and-pregnancy-western.8(4)1,2015.). Vaginal examinations are not necessary and artificial rupture of membranes should be avoided to scale back the risk of body fluid exposure. Spontaneous vaginal delivery should be anticipated. It is terribly possible that delivery will be of a small or pre-term infant; thus, obstruction is a particularly rare event in this circumstance.

If an attendant is present at the time of delivery and chooses to assist, they should stand side-on to the patient to avoid any body fluid splash. Episiotomies and other surgical interventions should not be performed. Vaginal tears should have pressure applied to stop bleeding, but not be sutured. The chance of EVD transmission by sharps injury is of disproportionate risk to the health-care employee (Caluwaerts *et al*., 2014). Furthermore, surgery while wearing PPE is impractical due to poor vision, sensation and high operating temperatures (Black, 2015). As presence at delivery cannot be guaranteed, and the major concern is post-partum haemorrhage (PPH), active management of the third stage is usually recommended (with the exception of assisted placental delivery). The woman should be given 600 µg of misoprostol and carefully counselled on taking the tablets orally after delivery. It must be ensured that she understands the directions not to take misoprostol before delivery. If there is any suspicion of multiple pregnancies misoprostol should not be given until the placenta has been delivered (World Health Organization, 2014). This a practice previously used in remote settings to prevent and treat primary PPH (Rushwan, 2011). During this instance, it is useful both as an oral uterotonic particularly since it can be self-administered whilst health-care staff are donning their PPE.A ‘Maternity Box’ should be prepared and brought to the area of expected delivery once labour has begun. A woman bleeding inside the EMC maybeterriblytroublesome to manage given the constraints of PPE and high-risk area procedures. Associated DIC may exacerbate bleeding and limit the ability to gain prompt haemostatic control. Having the appropriate means and training in place at delivery reduces both the time-to-treatment interval and stress to the health-care provider.

Having intravenous access and drugs ready prepared allows for fast and easy administration. Uterine fundal massage and insertion of a urinary catheter can also be safely performed and may assist resolving uterine atony. More invasive procedures, such as uterine exploration or balloon tamponade, are generally not advised. However, this will depend on the discretion and expertise of the health-care workers present as well as the specific situation and setting (Baggi, 2011).The placenta and foetus should be treated with the same infection control precautions as any corpse in the high-risk area. There should be ready access to an appropriate disinfectant, absorbent pads and a child-size body bag for safe disposal. In the unlikely event of a live birth, the baby must be assumed to be Ebola positive and highly contagious. The mother can nurse and breastfeed the baby, though she should be sensitively counselled on the high likelihood of neonatal death.

Post Natal Care

Any woman who has survived delivery following EVD infection must be carefully counselled on post-natal care. Where possible, a lactation suppressing drug should be administered (e.g. cabergoline). If this is not feasible, a breast pump should be provided with clear instructions on safe disposal of the infected milk, and how to employ a weaning technique with the aim of ceasing lactation. In the African setting, discharged patients are given supplies to assist them with re-entry into their community. This includes medicines, nutritional supplements and clothing. Previously, only men received a three-month supply of condoms to reduce the risk of sexual transmission; however, given that Ebola virus has also been detected in vaginal swabs, this should apply to both sexes. Post-natal women should also receive hygiene pads and iron supplements (Caluwaerts *et al*., 2014). As with all stages of Ebola management, counselling and effective communication are paramount. The surviving pregnant woman is very likely to be recently bereaved, not only from the current pregnancy, but often with deaths of close family members including other children and her partner. Returning home she may suffer stigma, social isolation and economic hardship. She is, however, also a rare beacon of hope for a traumatised community, and with the right support is able to act as an ambassador for the ongoing response (Medecins Sans Frontieres, 2014).

Family planning

All women of reproductive age should be offered effective contraception at the time of discharge from an EMC, including those who have delivered during the course of their illness. This is both to allow time for them to recover from their recent illness, and also in recognition of the gross lack of safe maternity services in the most affected region. Women being discharged fall into a unique group where both their negative Ebola status (hence safe for health-care workers to insert contraceptive devices) is known, as well as that they are known to not be pregnant and are therefore suitable for most contraceptive options (Black *et al*., 2015).

Wider implications

Ebola is a disease that spreads great fear amongst the affected (and unaffected) populations. The deaths of health-care workers have impacted greatly on a health-care system that was already under resourced and vulnerable. The nature of how Ebola is spread and its particular difficulties in pregnancy has led to women being refused access to emergency obstetric care[64.] Furthermore, women and local communities have become fearful of hospitals which were associated with Ebola cases, and occasionally as amplification centres of disease due to poor infection control procedures (Forrester, 2014). These knock-on effects of the epidemic have resulted in a dearth of maternity care, and projections of maternal mortality rates reaching up to 1 in 7 pregnant women dying during childbirth (Bosely, 2015) in the three worst affected countries. It is clear that for pregnant women in an Ebola epidemic the greatest risk appears not to be Ebola but the wider impact of the epidemic on their access to safe services. This cannot be ignored, and for future epidemics a contingency plan should be in place from the outset. Further knowledge is required to develop triaging systems that incorporate the wider obstetric picture and an emphasis on risk of exposure as well as symptoms. Unfortunately, the reality is that women with obstetric complications will continue to pose specific challenges to health-care providers in this or similar settings. It could be argued that given these barriers to care, pregnancy itself has become a life-threatening condition in the Ebola epidemic setting. It is therefore of high importance that adequate access to family planning be available as a life-saving intervention[63]. The United Nation's Populations Fund has estimated that 1.2 million women in the affected region could be lacking access to family planning, and has projected that 120,000 women could die from childbirth-related complications over the next year as a result of the loss in health care (UNFPA, 2014).

Conclusion

Ebola virus is one of the dangerous disease its effect, Symptom, Mode of transmission must be understood fully as it is a life threading disease one should be aware and pregnant women's should follow all the instructions and important things carefully. Ebola is zoontic flavion virus it is more deadly as we think. As it is transmitted directly by blood or body fluids but not by air or water for this studies have shown that death or pregnant women's or more often due to this deadly virus and if not died then the dilvery process will be dangerous and a post natal care should be there. So it is better to be safe than to be sorry.

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