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# Seminal Fluid: Potential Sources of Ebola Virus Disease Transmission in the Population

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## Short Commentary

The 2014/2015 Ebola outbreak in West Africa is undoubtedly one of the largest and deadliest in recent history of viral hemorrhagic outbreaks. Unlike previous Ebola outbreaks, the 2014/2015 outbreak has proven to be the largest and most challenging since the virus was discovered in 1976 [1-3]. The epidemic which began possibly in Guinea in December 2013 quickly spread to Sierra Leone and Liberia was officially declared a public health emergency of international concern by the World Health Organization (WHO) in August 2014 [4]. The course of the outbreak saw its spread to neighbouring countries -Nigeria, Mali, Senegal, and other non-African countries -Spain and the USA.

Since its onset, the outbreak has caused substantial morbidity and mortality. As at June 27, 2015, over 27,541 confirmed, probable and suspected cases of Ebola virus disease including 11, 235 deaths from 10 countries had been reported to WHO [5]. Ebola outbreaks are known for their high fatality in some cases up to 90% [6,7]. In the absence of any approved drugs or vaccines to fight the virus, this high fatality is not surprising. Case fatality in the 2014/2015 Ebola outbreak has ranged between 40-70% with higher figure at the early stages of the outbreak [5]. However, as the outbreak matured survival rates improved with concerted efforts at encouraging early reporting and laboratory detection, access to medical care and aggressive supportive care [8].

Surviving Ebola is becoming a more achievable reality in this outbreak compared to previous such outbreaks. The fact is that this outbreak has resulted in the largest number of Ebola survivors ever recorded in history. These growing and significant groups of persons-Ebola survivors- seem to hold the key to demystifying and better understanding the disease moving forward as well as providing the scientific basis for an effective vaccine.

From a virological perspective, survivors have been shown to still be positive for viral RNA in some body fluids for various periods of time after the acute viraemia [9]. Research has documented the presence of the virus in various body fluids including breast milk, mucosal membranes of the eye, semen as

well as rectal and vaginal fluids for periods ranging from 1 to 3 months and even longer [10,11]. During the Nigerian outbreak, laboratory observations using the quantitative Real Time PCR platform to monitor convalescing patients' viral RNA in the blood and semen showed that the virus remained many months longer in the seminal fluid than blood [12]. The presence of the virus in the seminal fluid of these survivors' months after recovery suggests the continued presence of live and potentially infectious virus in these individuals.

Field experience in West Africa has supported the assertion that asymptomatic persons are not infectious [12]. The reality of seemingly recovered and well looking patients walking around with active and infectious levels of the virus in various body fluids contradicts this fact. How much this reality changes the landscape of the epidemiology of the virus remains debatable. Some researchers are of the opinion that this does not constitute a threat and has very little impact on the spread of the virus [13-15]. However, the investigation of the case of the woman infected in Liberia is suggestive of infection from a convalescent index case who may have had the infection possibly a few months earlier [16].

The well-publicized practice of issuing Ebola-free certificates to survivors in endemic countries who test negative to Ebola indicating a 'clean bill of health' remains a best practice provided testing was based on the PCR platform and not mere antigen capture enzyme immunoassays (EIA). However it's limited in that it only applies to those discharged from recognized treatment centres and supported with counselling and protocols to guide positive living post infection. Field reports continue to suggest that the official numbers made available grossly underestimate the true figures and scale of the epidemic [17,18].

Similarly, people have been known to shy away from treatment centers for various reasons -ranging from lack of confidence in the system to a complete denial of the disease or fear of stigmatization and shame- but somehow manage to survive the disease [19]. The Nigerian man who managed to evade surveillance and flew from Lagos to Port Harcourt to seek treatment is a case in point [20]. Furthermore, fear of stigma, rejection, income loss or loss of their property associated with having had the disease may make people

unwilling to admit to being victims or to even any exposure. As such they miss out on the needed specialized counseling services on how to live positively post infection.

The concern is that this growing numbers of asymptomatic, healthy looking but infective persons may constitute a potential source of infection. The WHO has noted a strong possibility of transmission in this case which still needs to be proven [21].

From the perspective of international travel and health, this evolving possibility could present a new challenge. The on-going 2014/2015 outbreak continues to leave in its wake the largest number of Ebola survivors, many of whom will remain undocumented. With the dynamics of population movement which is largely uncontrolled at ports of entry in many developing countries, there is the need to further understand and quantify this reality of this threat and its implications for international travel.

Countries need to evaluate this risk very carefully and undertake strategies to prevent the possibility of sexual transmission while at the same time continue to show respect, dignity and compassion to all Ebola survivors to avoid stigmatization.

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