The Ebola virus epidemic: A concern for dentistry?

By Prof. Lakshman Samaranayake, Australia

Twenty-two years ago, a seminal report from the Institute of Medicine (IOM) in the US, titled “Emerging Infections: Microbial Threats to Health in the United States”, warned of the dangers of so-called newly emerging and re-emerging diseases. The concept of “emerging infectious diseases”, introduced then by the IOM is now well entrenched, and to our chagrin we have witnessed many such diseases over the last two decades. These include variant Creutzfeldt-Jakob disease/bovine spongiform encephalopathy, severe acute respiratory syndrome, and Middle East respiratory syndrome, and above all the pandemic of acquired immune deficiency syndrome (Aids), which has claimed millions of lives the world over. The re-emerging infectious diseases we have seen include diseases caused by meticillin-resistant Staphylococcus aureus, and multi-drug-resistant and extensively drug-resistant tuberculosis.

Interestingly, the concept of “emerging infectious diseases” is not new. Indeed ancient Greek, Roman and Persian writers documented the emergence of many new epidemics. In more recent times, the scientist Robert Boyle presciently observed in 1665 that “there are ever new forms of epidemic diseases appearing […] among them the emergent variety of exotick and hurtful […]”. Arguably though, the most noteworthy relatively new emerging infectious disease with the greatest impact on the dental profession has been the human immuno-deficiency virus and Aids.

And now we have a severe epidemic of Ebola virus infection. It is back with a vengeance, this time in West Africa, with over 3800 cases and a 69 per cent case fatality ratio at the time of writing. The culprit is the Zaire ebolavirus species, the most lethal Ebola virus known, with case fatality ratios up to 90 per cent.

According to the IOM report, there are many reasons that new diseases emerge and re-emerge. These include health care advances with the attendant problems (e.g. transplantation, immunosuppression, antibiotic abuse, and contaminated blood and blood products) and human behaviour, including injectable drug abuse and sexual promiscuity. Societal occurrences, such as economic impoverishment, war and civil conflict, too are critical according to the IOM. The current outbreak of Ebola virus infection...
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is a perfect storm created by a lethal combination of these factors, including rampant deforestation, poverty and the war-stricken situation in many African countries.

So how does Ebola spread? According to World Health Organization reports, Ebola virus disease (EVD) is introduced into the human population through close contact with the blood, secretions, organs or other bodily fluids of infected animals. Human-to-human transmission is through direct contact (through broken skin or mucous membranes) with the blood, secretions, organs or other bodily fluids, such as saliva, of infected people, and indirect contact with environments contaminated with such fluids. Transmission through the air has not been documented in the natural environment, nor have there been any case reports of transmission through saliva contamination. Infection in health care settings has been due to health care workers treating patients with suspected or confirmed EVD, especially when infection control precautions were not strictly practised. Reports indicate that those who recovered from the disease could transmit the virus through their semen for up to two months after recovery.

EVD is a severe acute illness characterised by the sudden onset of fever, intense weakness, muscle pain, headache and sore throat. This is followed by vomiting, diarrhoea, rash, impaired kidney and liver function, and both internal and external bleeding in some cases. Oral manifestations, such as acute gingival bleeding, have been reported. The mortality rate of EVD is very high and 50 to 90 per cent of patients die owing to the profound systemic haemorrhage or its complications. The incubation period of EVD is 2 to 21 days.

Up to now, there have been no reported cases of transmission of EVD in any dental settings. However, the fact that it is transmitted through human secretions, which includes saliva, and that the incubation period could last up to 21 days implies that dental care workers in the endemic areas of the virus, such as West Africa and sub-Saharan Africa, may run the risk of acquiring the disease if strict standard infection control measures are not routinely followed.

In dentistry, we are constantly exposed to these emerging and re-emerging infectious threats and we cannot afford to let our guard down. Vigilance, awareness and good clinical practice with standard infection control at all times are fundamental to prevention, as yet-unimagined new diseases surely lie in wait. Although we have made spectacular technical and scientific advances since the release of the original IOM report some two decades ago, it appears that humans are still defenceless in the face of the relentless march of our microbe foes.

Prof. Lakshman Samaranayake is head and Professor of Oral Microbiology and Infection at the University of Queensland School of Dentistry in Brisbane in Australia. In the upcoming days, he will presenting a lecture as well as a seminar discussing infection control in dentistry as part of the FDI 2014 scientific programme.

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