Ebola: Personal view from the field – Sierra Leone

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Experiences of healthcare workers responding to the Ebola epidemic in West Africa vary with the types of facility. Patients suspected of having Ebola virus disease (EVD) must be isolated from each other as well as from the wider community until testing is complete; in Sierra Leone such facilities were called Ebola holding units (EHUs). Once EVD was confirmed, patients were moved to Ebola treatment units, where they could be cohorted together safely and treatment efforts focused on EVD itself. While a number of purpose-built units combined an EHU with an Ebola treatment unit, my personal experience was of working in a number of stand-alone EHUs in Freetown, Sierra Leone.

The model of care in Freetown, Sierra Leone

I was placed with King's Sierra Leone Partnership, which is based at the Connaught Hospital, the largest public sector hospital in Sierra Leone. They were working on health system strengthening long before Ebola arrived, and rapidly scaled up their efforts, including the hasty construction of an 18-bed Ebola holding unit (EHU) when the first Ebola virus disease (EVD) cases arrived in the city in May 2014. A further six smaller EHUs were then constructed at health facilities in and around the city. The aim of each unit was primarily to protect staff in other parts of the facility so that they could work as normally as possible. As such, all patients presenting for care, regardless of their symptoms, were first screened for EVD. Those who screened positive were moved to the EHU and the rest continued with care in the facility as usual. The screening algorithm had to be highly sensitive to prevent EVD patients progressing to the general facility, and it was therefore necessarily nonspecific. As a result 30 - 40% of patients admitted to the EHU did not have EVD, which raised some obvious concerns.[1] Most important was the need firstly to practise high-quality infection prevention and control between patients to prevent nosocomial transmission, and secondly to provide treatment for conditions that mimic EVD. Because there were no diagnostic tests at all, it was decided to give all patients antimalarials and ceftriaxone (in case of typhoid or other bacterial infections). It cuts against the grain of an antibiotic steward to use empirical treatment in this way, but this was no ordinary situation.

The clinical problem

Although EVD has always been considered a viral haemorrhagic fever, very little bleeding was seen during the current epidemic.

Rather it proved to be a severe viral gastrointestinal illness with associated fever and thrombocytopenia,[2] so that fluid and electrolyte replacement was critical. Patients who were alert and orientated without vomiting could be encouraged to drink large volumes of oral rehydration solution, and intramuscular antiemetics could be used if needed. The decision to use intravenous fluids was hotly debated among the team I worked with. Proponents, including myself, pointed to the survival benefits that were likely to accrue from replacing lost volume and salts. Opponents had usually seen severe adverse events such as patients pulling out cannulas and bleeding profusely, constituting a high-level infection hazard and hastening death. We

deemed intravenous fluids to be contraindicated in patients who were agitated or confused or who bled excessively when blood was drawn. This group in fact had a very poor outlook, and we concentrated on palliative measures. Those in the middle ground, patients who were not confused and agitated but were struggling to keep up with oral fluids, were given intravenous therapy.

The mortality from EVD in West Africa is estimated at around 60%. For foreign healthcare workers presenting to high-resource settings in the early stages it is close to 0%, and the ultimate reason for this is clearly resource availability. There is no good evidence that novel therapies such as Zmapp or convalescent plasma make a huge difference; rather, meticulous attention to detail regarding fluid and electrolyte balance, prompt recognition and treatment of secondary bacterial infection and a host of other basic interventions are important. In contrast to high-resource settings, the units I worked at were not able to test any blood parameters or even monitor temperature and blood pressure regularly. Fluid inputs and outputs could only be measured in the most rudimentary of ways. The average amount of time spent with a patient each day was around 20 minutes, each minute spent wisely to tip the balance in favour of survival.

The working environment

Day-to-day work in an Ebola treatment unit did not draw heavily on my medical skills. Most tasks would normally be undertaken by nurses, cleaners or porters. A typical shift involved moving patients in and out of the unit, doing rounds with medication, fluids and food, and preparing corpses for the burial team by cleaning, bagging and carefully labelling them. Our team had a very flat hierarchy and included expatriate doctors and nurses alongside national staff who included fully qualified nurses, nursing students and hospital cleaners. There were very few Sierra Leonean doctors involved in the response.

The one area of work that did require some clinical skills was assessment of patients for admission to the unit. The screening algorithm was not perfect, and some patients with a negative screen clearly needed admission and testing while others, typically those with chronic illnesses including tuberculosis and HIV, might have screened positive but were in clear need of inpatient hospital care.

I was fortunate to be involved in a number of activities away from the hospital EHU. Most interesting was working on the development of smaller EHUs at satellite facilities. There was a constant need for training, supervision and encouragement, as these units lacked the institutional knowledge of a large tertiary hospital. Being able to keep these units running and therefore allow staff to continue with normal work was probably a major factor in preventing the Ebola epidemic from contributing to a total breakdown in the healthcare system that

could have heralded secondary epidemics of vaccine-preventable diseases and increased mortality from malaria.

The research agenda

Away from the EHUs themselves, there was also research to be planned and carried out. VIP visitors were common, and I was fortunate to have face-to-face meetings with the heads of the Centers for Disease Control, the Wellcome Trust and the London School of Hygiene and Tropical Medicine, to name a few. We were involved in planning and discussing the ethics behind vaccine trials and evaluating a rapid point-of-care diagnostic test for Ebola,[3] all of which added to the experience. However, there was a frustration that research efforts were sometimes aimed at expensive high-tech solutions such as novel antivirals and convalescent plasma, when the basic standard of care, including low-tech solutions such as antidiarrhoeals and antibiotics, had not been optimised.[4]

Despite the dreadful nature of the disease and the immense suffering of the patients, from a personal perspective my visit to Freetown was extremely rewarding. As an infectious diseases doctor it was refreshing to be at the centre of such an important event.

1. Lado M, Walker NF, Baker P, et al. Clinical features of patients isolated for suspected Ebola virus disease at Connaught Hospital, Freetown, Sierra Leone: A retrospective cohort study. Lancet Infect Dis 2015;15(9):1024-1033. [http://dx.doi.org/10.1016/S1473-3099(15)00137-1]
2. Chertow DS, Kleine C, Edwards JK, et al. Ebola virus disease in W Africa – clinical manifestations and management. N Engl J Med 2014;371(22):2054-2057. [http://dx.doi.org/10.1056/NEJMp1413084]
3. Walker NF, Brown CS, Youkee D, et al. Evaluation of a point-of-care blood test for identification of Ebola virus disease at Ebola holding units, Western Area, Sierra Leone, January to February 2015. Euro Surveill 2015;20(12):21073. [http://dx.doi.org/10.2807/1560-7917.ES2015.20.12.21073]
4. Boyles T. Priorities in Ebola research – a view from the field. Lancet 2015;385(9962):23. [http://dx.doi.org/10.1016/S0140-6736(14)62469-7]