EDITORIAL

Ebola virus disease: One year later

Enfermedad por virus Ébola: un año después

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In December 2013, in a remote area of Guinea, perhaps through direct contact with bats carrying the Ebola virus, a child fell ill and died a few days later. Starting, possibly, from this case, the disease gradually spread, first among his family members and carers, then among their contacts, and finally travelling with ease through highly permeable border areas, at first among small population centres in Guinea-Conakry, Liberia and Sierra Leone, and subsequently reaching the capitals of these countries.

The epidemic did not go unnoticed, but its importance was clearly underestimated and it did not receive the appropriate response at the right moment, that is, at the start. A year later this is undoubtedly the worst epidemic in the history of Ebola virus disease (EVD), with over 20,000 recorded cases by the end of 2014 and nearly 8000 fatalities (Table 1), including 800 cases among health care workers. The charity Médecins Sans Frontières (MSF) raised the alarm as early as Spring 2014, warning that "the epidemic was out of control". The WHO finally declared the situation a "Public Health Emergency of International Concern" in August 2014, following the guidelines of the International Health Regulations.

The epidemic also produced isolated outbreaks in 2014, originating from imported cases, in Nigeria, Senegal and Mali. More than two dozen infected and sick expatriates (health care workers) have been evacuated to various countries in the European Union and to the United States for treatment. Two imported cases of EVD were recorded in the USA and three secondary cases among health care staff treating patients with EVD (two nurses in Dallas and a nursing assistant in Madrid), and it was then that Western public opinion and media devoted the greatest attention to the epidemic, which came to be described as a "threat to national security". Soon after this the United Nations set up a special committee (UNMEER: the UN Mission for Ebola Emergency Response) to coordinate the international response, led basically by the USA, the United Kingdom and France themselves, with aid focused respectively on Liberia, Sierra Leone and Guinea-Conakry; this aid is still proving insufficient and is (and has been) arriving several months late. So far Spain has hardly contributed to this international response.

The differential causes of this epidemic must be sought in the geography, demography and social situation of the affected area. West Africa had not previously suffered outbreaks of EVD, although in some parts of the region there have been small and sporadic outbreaks of Lassa fever. This natural reservoir of the virus in West Africa was probably introduced a few years ago by the migration of the species of bats that are potential carriers of the Zaire subtype of Ebola virus (EBOV), which is responsible for the current epidemic.

The three capitals of the affected countries, Monrovia (Liberia), with a population of 1.1 million, Freetown (Sierra Leone), with a population of 1 million, and Conakry (Guinea-Conakry), with a population of 2.2 million, have features in common that are significant for understanding the situation. They are the largest cities in each country, they have very
The problem is that the strain of the virus is similar to that of the final stages of the disease, its basic reproduction number of transmission is the same (direct contact with blood which has caused other epidemics, the mean incubation period is high, and equal to that of adults, but when few publications containing paediatric data, the fatality rate have the same risk of developing EVD as adults. In one of the breaks have arisen in regions where resources are scarce and the information available to us on the impact of the virus on the paediatric population is limited, since previous outbreaks have arisen in regions where resources are scarce and data on paediatric cases have not been routinely collected.

The signs and symptoms of EVD in children are similar to those in adults, but although information is limited, non-specific initial symptoms different from those in adults have been described in children. Fever tends to be constant (87–100% of cases). Initially it is associated with asthenia, loss of appetite and cough, with nausea, vomiting and diarrhoea in the first week described in nearly 70% of cases, and less frequently irritability, headache, abdominal pain and sore throat. Fever therefore seems to be more common in the clinical presentation, as are gastrointestinal and respiratory symptoms, all of which are more common in children. On the other hand, haemorrhagic complications are less frequent (around 16%) in paediatric patients.

Certain characteristics of the child population could worsen the condition of patients when they present with some of the initial symptoms of the infection. The younger children are, the more prone they are to become dehydrated by vomiting or diarrhoea. Their reserve of body fluids is smaller than that of adults, and this increases the risk of rapid dehydration, which is common with this disease. Children also have a lower volume of circulating blood that adults, and therefore without prompt intervention relatively small losses of blood can become more serious and affect haemodynamic balance more rapidly.

The pathogenesis of EVD in children could be different from that of adults, as a greater inflammatory reaction has been shown, and also the endothelial production of a substance (RANTES expression) that does not occur in adults. This could be less frequent (around 16%) in paediatric patients. Certain markers are very difficult to modify by therapeutic intervention.

The situation of pregnant women with EVD is one of extremely high fatality, both for the mother and for the newborn. Maternal mortality rates are nearly 95%, commonly with miscarriages in the first or second trimester and premature stillbirths in the last trimester (neonatal mortality close to 100%). It must be borne in mind that these data come from countries with scarce resources and that other concomitant diseases such as malaria, STD, HIV, etc. may possibly contribute to the high mortality.

There are other associated factors that distinguish cases of EVD in the paediatric population. Small children depend on their parents or other adults to meet their physical and psychological needs, and this poses a unique situation in terms of isolation and quarantine protocols. For example, if a case of a child with suspected EVD arose in Spain, only one of the parents could stay with the patient, provided that parent was informed and accepted the risk, and adopted individual protective measures. But if a suspected case were confirmed, what would we do with the parents? It is difficult to train parents quickly and ensure that they comply with all the rules on protection and proper use of personal protective equipment (PPE). Besides, they could not wear...
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The paediatric population is always the most vulnera-
able in emergencies, and since the initial outbreak of EVD,
children and their families have been exposed to situations
of anxiety due to bereavement and family separation
subjected to isolation and to the general disorganisation
of society. Being confined to the home through quarantine and
witnessing the suffering of family members are especially
painful experiences for children. Despite the efforts made
to spread information in the affected areas, Ebola orphans
and surviving children continue to face abandonment and
stigmatisation in their communities. The quarantining
of whole towns and villages makes it difficult to obtain ade-
quate food, leading to an alarming increase in malnutrition.
In addition, there are an increasing number of reports of
EVD survivors who cannot even buy food at local markets,
because people fear they may still be able to infect them.

The repercussions on the health of the child population
take the form of an increase in mortality from malaria, diar-
rhoea and respiratory and other infections, due to reduced
access to Health Centres, many of which have been closed
since the start of the epidemic, and reluctance to attend
health care facilities for fear of being infected. There is no
access to education, because the schools were closed by gov-
ernment order as a preventive measure as soon as the crisis
was declared. UNICEF estimates that the closure of schools
has affected the education of over 4 million children. We
know from other crises that once children abandon school,
many of them never return and they run a high risk of becom-
ing involved in child labour and other kinds of exploitation.

In Spain, the decision to repatriate two missionaries, both
health care workers, in a serious clinical condition and in
an advanced stage of EVD, who died a few days after being
transferred and admitted to the Carlos III Hospital in Madrid,
was difficult and questionable. Decisions were obviously
taken under intense political and media pressure and quite
probably with a certain degree of improvisation, especially
as regards where the two patients were placed (the Car-
los III Hospital), bearing in mind its state of preparedness
and the availability, at the time, of staff properly trained
to look after patients suffering from a highly transmissible
disease with a high mortality rate. Probably nobody in Spain
was adequately prepared to care for these patients at that
time. The infection of the nursing assistant in Madrid from
the second repatriated case precipitated a serious crisis sit-
uation and increased the level of uncertainty and distrust
over the safety of the protocols. We ‘‘hit rock bottom’’, so
to speak. Something similar occurred in the United States,
arising from the secondary cases in Dallas, which obliged
the CDC to revise and completely rethink its strategy and
prevention measures.

In the Spanish hospitals designated to treat cases of EVD
we have been working and continue to work intensively to
update and adapt our protocols and to improve the level
of training of the health care staff responsible for the care
of cases of EVD under investigation and the level of infor-
amation of the rest of the hospital staff, so that we work
safely and carry on as normal when we admit a patient with
suspected EVD. It has not been and is not easy. To para-
phrase an American colleague, ‘‘we’re building the boat
while sailing’’.

Moreover, the possibility of treating paediatric cases or
pregnant patients with suspected EVD in our hospitals poses
a series of additional problems which make it even more
complex, if that is possible. In our experience, the best
way of working is to establish mixed, versatile teams that
include paediatric doctors and nurses together with doc-
tors and nurses specialising in intensive care. In addition
to these kinds of clinical care staff, it is vitally important
that teams pay close attention to incorporating ancillary health
care staff and cleaning, maintenance and security staff, for
example. The environment (the care unit) must be safe and
must have sufficient space and resources to carry out any
task, however simple it may seem, under direct supervi-
sion (observation) and indirect supervision (recording with
video cameras). Attention has already been drawn to the
extreme importance of training in putting on and removing
the current Personal Protection Equipment, which is cer-
tainly uncomfortable and which does not allow the care
process to be performed completely as normal or for many
minutes at a time. Every entry into the isolation unit must
be carefully scheduled, planned and conducted according
to protocol. Specific training in the various clinical situations
that are most likely to occur (from simple patient hygiene
to intubation and mechanical ventilation) must be intensive
and must be conducted under real working conditions. The
safety of the professionals (the main objective of any care
process in these circumstances) depends on the resources
available, on the training received and especially on confi-
dence in good teamwork, with adequate supervision of each
and every one of the actions performed by each and every
member of the team.

In the Mixed Unit formed by the Hospital de Sant Joan
de Deu and the Hospital Clinic in Barcelona, certified by
the Ministry of Health (MSSSI) as a Referral Centre (CSUR)
for Imported Tropical Diseases, we have adopted a model
in which all the professionals belonging to the care team
for each case of EVD under investigation (and of any other
transmissible disease with a high biological hazard level)
are volunteers, properly trained and prepared. This team
especially includes physicians and nurses specialising in Paed-
diatrics, Intensive Care, Infectious Diseases and Tropical
Diseases. There are a further two supplementary teams: a
specialised team (of Obstetricians and Neonatologists) capa-
bale of offering care to pregnant patients with suspected EVD
(including possible delivery) and a team that ensures care
can be provided for cases of suspected EVD requiring sur-
gical assessment or involving an orthopaedic problem. Both
teams include specialists in Anaesthesiology and Resuscitation. These two situations (patients with suspected EVD who are pregnant or in labour and surgical patients with suspected EVD) are unlikely to occur in our setting, but it was considered necessary to establish and train these teams (also made up of volunteers) to cover that eventuality, which has meant formulating and applying specific protocols (no easy task in the case of a pregnant patient given the additional risk involved in exposure to blood and body fluids during delivery) and carrying out specific simulations.

In West Africa the epidemic seems to have entered a phase of better control (with a sustained decrease in the number of cases), though to varying degrees. Liberia has achieved a clear reduction in the number of new cases, Guinea-Conakry shows much more irregular progress, with periodic rises and falls in the number of cases, and Sierra Leone has the worst figures, with an increase, albeit more moderate, perhaps, in the number of cases. Nigeria, Senegal and Mali have brought the localised outbreaks originating from imported cases under control and have been declared free of the disease. The United States and Spain have also been declared free of the disease for the same reason.

The current increase in aid, from official sources and various charity organisations, in the area of West Africa means increased likelihood of infection among expatriate workers or high-risk exposure, leading to medical evacuation of such workers, on the one hand, and an increased risk of detecting an imported case among these workers once they have returned to their country of origin after their period of service in the epidemic zone. Examples of the foregoing are what has already happened in Spain (the case of risk exposure in an MSF doctor) and in the United Kingdom (detection of a confirmed case in a nurse after her return from the epidemic area), as well as several other cases of repatriation of confirmed cases or high-risk exposures in several EU countries and in the USA.

For all these reasons we must not lower our guard. The virus will not be eradicated in West Africa this year (2015); international aid will continue to be insufficient and has not achieved the anticipated objectives. The negative economic consequences for these countries will be substantial; many children have lost months of schooling and the health care systems are in a state of collapse. The “collateral damage” will be very severe: more orphans and an increase in mortality from other causes, especially mother/infant mortality, for lack of health care.

We, from our undoubtedly privileged position, must try to fulfil two objectives: the first is to contribute significantly to controlling the epidemic at its source and helping to re-establish and strengthen the health care systems of the affected countries. The second is to ensure the safety and effectiveness of any rapid detection process here in Spain and health care for suspected cases of EVD (health workers, aid workers, travellers, immigrants, etc.) from the epidemic area. As long as there is an epidemic in Africa we will all be at risk.

References