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Perspective

Ebola Virus Epidemic and Preparedness of United Nations Peacekeeping Medical Missions in Liberia

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Abstract

Ebola Virus disease (EVD) outbreak in 2014 was the most devastating of its kind ever recorded. The overall effect of the epidemic affected all walks of life. The worst hit areas gave a deserted looks and health care infrastructure was shattered. United Nations Peacekeeping Forces in Liberia were not acquainted with this disease and its propagation. We developed in-house protocols and started awareness campaign among the Peacekeeping troops to protect themselves from EVD. The psychological impact of the outbreak was overwhelming but effective training for use of protective equipment helped alleviate the fears among Health Care workers. Sustained efforts of spread of awareness coupled with international expert support resulted in containment of the epidemic with in less than a year. This manuscript describes the unique experience of stay in the heart of this epidemic for over twelve months.

Keywords: *Ebola Virus Disease; Preparedness; Quarantine; Outbreak*

People of Liberia will always remember the year 2014 for facing the worst ever outbreak of Ebola Virus Disease (EVD). This caused crippling of daily life, socio-economic infrastructure, mental peace and calmness of otherwise nearly settled civil war hit areas.

Since its first description in 1976, sporadic cases of EVD as well as dozens of outbreaks of variable magnitude have been reported in Western Africa. In late December 2013, first reported case of this epidemic of EVD surfaced in Guinea and soon the disease crossed the loose boundaries among the neighbouring countries and ended up in cases six countries of Western Africa. Italy, Spain, UK and USA also joined the group of affected countries with one or few odd travel related cases.

By start of August 2014, World Health Organization (WHO) declared EVD as a "Public Health Emergency of International Concern" and Government of Liberia asked for international collaborated efforts from governments and non-government organizations to stop the spread. Much has been talked about the statistics of affected areas and waving scale of the disease spread. The main focus of this manuscript is to present the perspective under which UN Peacekeeping Forces serving in EVD hit areas experienced the rise in scale of the outbreak and the preparedness to face the unforeseen.

The Outbreak

As soon as the cases of EVD started pouring into hospitals, unaware health care workers (HCW) were the first to be exposed. EVD clinical presentation matched closely to the many prevalent infectious febrile illnesses endemic in the region. The casual, as well as

unprotected patient care of febrile EVD cases in clinics and hospitals started the chain reaction of spread among HCWs. As soon as awareness spread about deadly potential of EVD, this caused panic among HCWs. Unfortunately, leading physicians like Dr Samuel Brisbane of Liberia and Dr Sheikh Umar Khan of Sierra Leone also succumbed to EVD while heroically treating the victims of the deadly disease in their respective countries.

EVD knocked out the frail framework of health and social welfare in Liberia. John F Kennedy Hospital was the only major public hospital in the capital city Monrovia. The choked health care system certainly caused many casualties due to non-Ebola emergencies not being attended out of fear of the ongoing epidemic. Many emergencies ranging from trauma to full-blown pregnancies were left unattended and caused additional damage to the community.

A period of three weeks of quarantine for "Suspected" and "Probable" cases required a well-structured support and supply system for the hospital/quarantine area inmates. Complaints were heard across the city of complete locking down of the hospital wards with inadequate food and water supplies. The word spread across faster than the epidemic itself and many members of the community started losing trust in the hospitals and other health care establishments. Contact tracing was an inevitable but also appeared to be unreachable task at hand. People would start hiding in their homes or disappear in cases of illness or having a close contact history to avoid public rejection.

Common ritual at Liberia was to keep the dead body at home for short while followed by visits of the mourners. Visitors used to pay respect to the deceased by hugging and kissing the hands or forehead of the dead body. This could have been devastating since dead body of EVD patient is highly contagious with a soaring high viral load. A major discredit raged on the hospitals was holding back the remains of the deceased dying of EVD instead of handing them over to the families. There had been attacks on the hospitals and similar quarantine facilities where dead bodies and quarantined personal were "freed" respectively.

In Liberia, private vehicles/ taxis and motorcycles have been used as main mode of transportation within city and among counties. In this transportation, close contact was inevitable. Sick were transported the same way from peripheral areas to main hospitals. This resulted in exponential rise in the number of contacts that proved to be a nuisance while carrying out contact tracing later.

For most of the occasions, law and order remained with in control. Constant presence of peacekeeping forces in the area and results of well-organized relief work by medical agencies, most prominent and selfless being Médecins Sans Frontières (Doctors without Borders) International Federation of Red Cross etc. played a pivotal role in keeping the public reaction short of overt distress and open outrage. Nonetheless, there have been one or two occurrences of agitated response in some quarantined areas of the city of Monrovia. The over exaggerated reports appearing in some print media, of people dying of EVD by road sides as a common occurrence appeared to be far from reality. In advanced stages of the disease, the victim is too weak to walk on the roads.

The economic activity was badly affected during the EVD outbreak. Bigger businesses were mostly truncated, trade and industrial activity was close to be called "frozen", eateries looked deserted and religious congregations were discontinued at many places. There were no Ebola Treatment Units (ETUs) in the country in the initial days of epidemic and there had been uncertainty looming over the whole country about the fate of the victims of the disease. The life of military contingents was generally limited inside the closed complexes with little or strictly controlled movement across the fences. The interaction among the locals and the foreigners largely became less than warm. The psychological impact of EVD turned far greater than the disease itself.

Preparedness to face EVD challenge

United Nations Peace Keeping forces were deployed in Liberia for more than a decade under the auspices of United Nations Mission in Liberia (UNMIL). Military, paramilitary and police personnel from over fifty countries, of different strengths and roles were deployed all across the country. By middle of 2014, there were three major hospitals of UNMIL, Level II+ hospital in Monrovia (managed by Pakistan Army Medical Corps), and two Level II hospitals (responsibility of Bangladesh in Gbanga and China in Zwedru). PAKMED (official tag for

Pakistan Level II+ hospital) was the central hospital of UNMIL in Liberia with maximum number of qualified doctors of different specialties among all other UN hospitals. The dependent clientele of PAKMED was around five thousand UN employees in Monrovia as well as referral cases from other hospitals in distant counties. With the growing menace of EVD in the areas of respective responsibility, it became the need of the hour to prepare the HCW for facing the Ebola challenge. None of the countries offering their medical services in Liberia had ever faced such a challenge before.

PAKMED took the initiative of training of HCWs of own and different troops contributing countries (TCC). A dedicated team of qualified doctors comprising of Infectious disease specialist, Internists, surgical specialists, Intensivists and Psychiatrist was given the task to train the HCWs for handling any suspected patient of EVD reporting to the clinics. The main aim of imparting training was to ensure safety of the HCWs while attending to the febrile patients as a first responders. Further holding of the patients as well as transportation to dedicated Ebola Treatment Units (ETU) was also made part of the training program. Worth mentioning, safe disinfection practices with hygiene control and waste disposal were also the components of the drill.

In this context, PAKMED held number of workshops, symposium and interactive sessions in Monrovia where HCWs under the umbrella of UNMIL were given practical demonstrations of donning and doffing of personal protective equipment (PPE) and other elements of safe practices in the hospitals. Specialists from PAKMED also visited various establishments to suggest improvements in the preparations of receiving any Ebola causalities by other UN clinics. The role of UNMIL medical authorities remained more than supportive. Provision of PPE and other training aids were made available in no time. Series of lectures from guest speakers, most notably Dr Moses Massaqui from Clinton foundation, proved quite helpful in the understanding of the epidemic dynamics and self-protection strategies.

Train the trainers: In order to formulate a comprehensive training program, key persons from all medical establishments were selected for training purposes (Figure 1). The idea was to demonstrate them the key steps in receiving a suspected patient which were:

Figure 1: *Protection starts with proper Hand washing technique.*

- Donning and doffing of PPE
- Reception
- Documentation
- Risk assessment
- Holding the suspected case in an isolation facility
- Transportation of the case without risk of dissemination of infection
- Preparation of disinfectant solutions and daily turnover
- Safe disposal of waste generated during patient care

Interactive sessions were carried out for the participants (Figure 2). Audio visual aids along with handouts were provided. The response from the participants had been warm and enthusiastic. The information provided to them was taken up well by all. Such efforts helped a lot in alleviating the fear of unknown among medical personnel (Figure 3,4).

Figure 2: *Workshop for hands on training as First responders to EVD patient.*

Figure 3: *The emphasis was on making useful use of PPE.*

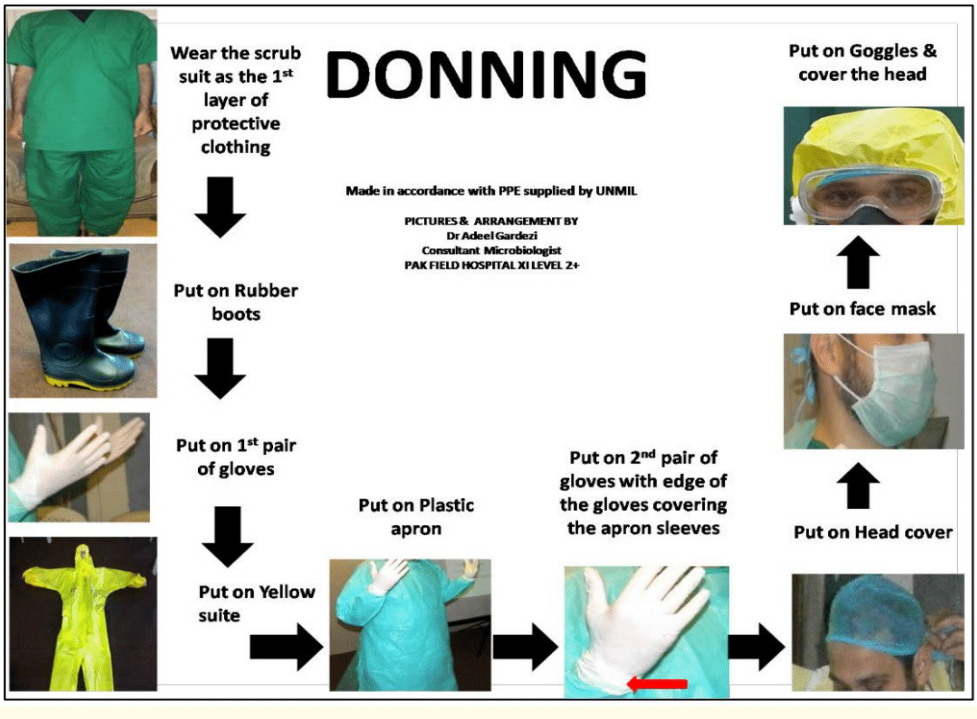
Figure 4: *Doffing needs to be most carefully done.*

"In-house" practice of protocols: There was a tremendous amount of psychological discomfort associated with dealing with cases of EVD. Our doctors and paramedics have served in the most hostile environments and have been involved in patient treatment and evacuation from highest battlefields in the world to terrorists infested lands. This was unlike any such situation. The increased chances of contracting disease by HCW had far reaching impact. In case of death due to EVD, burial had to be done away from home or even had the possibility of incineration of the body. Verbal reassurance of effectiveness of safe practices was not just good enough. PAKMED team members led from the front. We demonstrated number of times to our paramedics, the methods and protocols of safe patient handling. The practice of established protocols needed to be instilled in the minds of the HCWs to cast away the clouds of doubts about their own abilities to handle this dangerous situation. Daily practice sessions were carried out in the designated isolation areas for HCWs to make the protocols as part of their reflexes. With the mock exercises of receiving EVD patient and then following all the necessary steps mentioned earlier, emphasis was laid on equal learning of all the members of the Ebola Responder squad. A janitor had to display PPE donning and doffing skills at par to that of a physician.

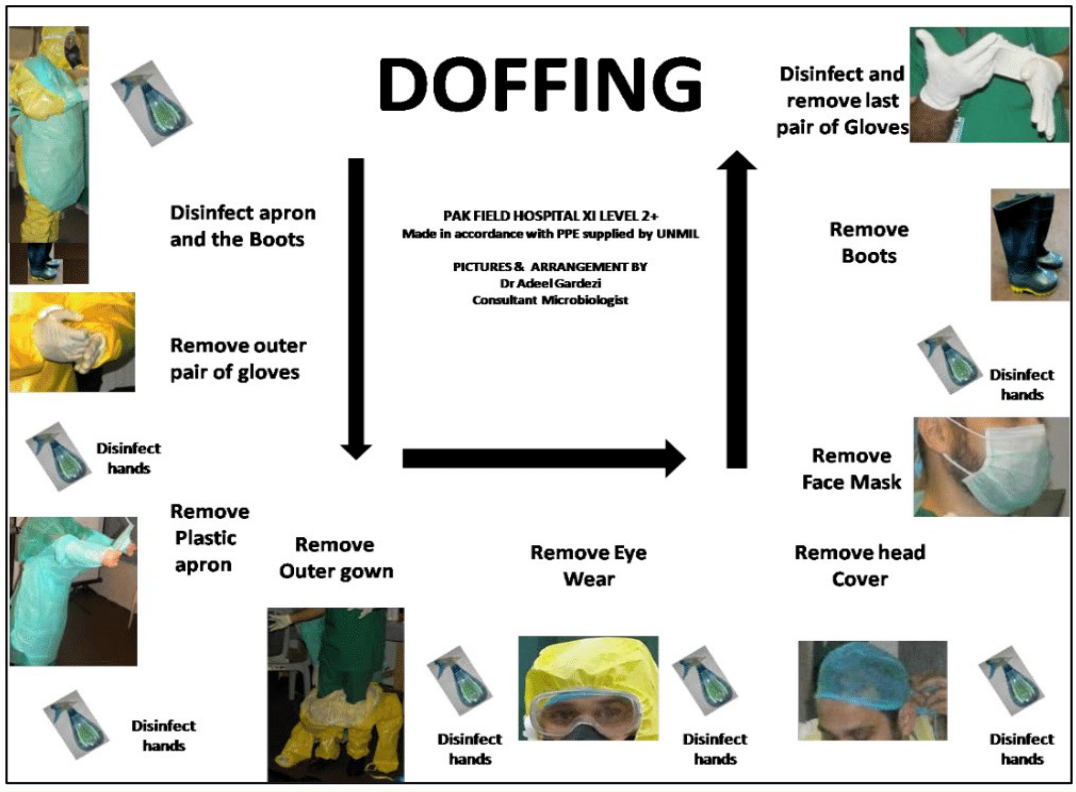
Dealing with Febrile cases: During the peak of epidemics, fever became a telltale sign of EVD for everyone regardless of the actual cause. Lab investigations were essential to differentiate among various causes of fever. Blood testing for malaria or typhoid or routine investigations in such patients carried risk of exposure to EVD. To address this issue, a balanced strategy was adopted. Lab testing for such patients was avoided unless deemed extremely necessary. After making thorough "Risk Assessment", empirical treatment with suitable antibiotics or anti-malarial drugs was prescribed to all such patients without lab investigations. This way hospital staff remained protected from unnecessary exposure to possible EVD. A successful therapeutic response was achieved across the board in usually three to four days. Although UNMIL authorities initially remained skeptical about this approach but it brought fruitful results. Anyone developing fever was supposed to inform a "Hotline" number of UN medical authorities. Such patients were advised to remain at their home and a team of Doctors and paramedics to be sent to assess the situation. After the team visit, a decision had to be made to provide necessary treatment at home for non-Ebola case or patient to be transferred to ETU in case of "Probable" EVD case.

Quarantine for troops returning home: There was a major issue of troops returning for leave from Liberia to Home country. There was an alert situation faced across the globe with travel restrictions implemented in different countries. There had been lot of psychological discomfort felt at various levels about the returning troops from EVD outbreak areas. There existed no certain policy by health authorities in most of the countries about travelers returning back from epidemic hit areas. We suggested a strategy, which was taken well by military contingents for their returning troops. A of troops was instituted inside the camps while still in Liberia. Three weeks before anticipated date of travel, movement of all personnel proceeding on leave, was restricted within respective camps. This "soft quarantine" also included a close vigilance on returning troops for development of any sign of illness among future travelers. When fully assured of perfect state of health and wellbeing, these members of contingents were allowed to travel to their homes. Chartered flights were advised to avoid transits at other destinations.

Control of outbreak: Government of Liberia, in collaboration with Non-Government organizations, international support and above all, people of Liberia became successful in curtailing the menace of EVD. There had been mass awareness program and the general population responded to the awareness call in an outstanding manner. The culture of hand washing was adapted in an unprecedented manner. No shop or public space entry was possible without washing hands by the entrant. Slogans like "Ebola is real" and similar watchwords were disseminated through posters, newspapers special editions, handouts, SMS messages etc. With the of establishment of ETUs all over Liberia and the commendable effort of local and foreign relief workers, contact tracing and patient management was achieved in a cordial fashion. Liberia was declared "Ebola-free" in May 2015. Since then a null period of several months passed but few flare up cases were reported in November 2015. Again subsequent contacts have been declared "Ebola-free" after two incubation period durations (21 days + 21 days). We consider awareness as a most potent tool that helped in controlling the peril of EVD. This single point agenda made it possible for effective surveillance, early detection for the symptoms, contact tracing, understanding the dynamics and importance of quarantine and prevention of subsequent spread in the community.



Handouts instructions for Donning PPE.



Handouts Instructions for Doffing PPE. Disinfectant spray at every step remains a cornerstone of prevention of infecting oneself.

Conclusion

EVD outbreak concluded with many lessons to learn. Financial resources play a key role in managing such outbreaks in a befitting manner. In addition, importance of application of scientific principles for "Risk assessment" and "Risk management" can never be underestimated. Such logical actions not only undermine the panic associated with such devastating epidemics but also instill confidence in general public to effectively deal with the imposing challenges. Culture of safety has never been employed in recent times with such zeal and enthusiasm before. This emphasizes need of adaptation of such safety practices and protocols in regular training programs particularly in hospitals as HCWs are first responders in any untoward situation.

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