Original Article

An Interventional Study To Assess Knowledge And Attitude of Medical Students Towards Ebola Virus Disease

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Abstract

Background: Ebola virus has been spreading in an unprecedented manner not only to neighboring countries in Africa but also to many other countries worldwide . Ebola Virus Disease is a severe, often fatal illness, with a death of up to 90%. There is no vaccine available in the market for this disease , so stress should be made on its knowledge , attitude and practice amongst medical staff. Also India has so far been spared from the EVD. However, the subcontinent is one of the native areas of the fruit bats that are reservoirs of the disease. Fruit bats from Bangladesh have been tested serologically positive. India being a highly populated country and lack of basic sanitary and health care facilities , India is at stake with immediate spread of the disease at a rate which would be worst than that in Africa. Aim: To assess knowledge and attitude regarding Ebola Virus Disease (EVD) among medical students. Material and Methods: : Interventional study was conducted among medical students at Adesh Institute of Medical Sciences and Research, Bathinda. Predesigned questionnaire was introduced to the participants in English both pre intervention and post intervention. A total of 503 students participated in the study. Results: 95.4 % of medical students had heard about Ebola. 102 out of 503 students thought that soap, bleach, sunlight and drying do not play any role in preventing its transmission and 62.2 % of medical students knew that a Ebola virus disease could have death rate of up to 90% of the cases. Intervention in the form of workshop was given and significant changes were there in the post interventional questionnaire analysis.

Keywords: Ebola virus, EVD, Knowledge and Attitude, Medical Students

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INTRODUCTION

Ebola virus disease (Ebola hemorrhagic fever) first appeared in 1976 with two concurrent outbreaks of acute viral hemorrhagic fever involving 284 cases (151 deaths [53%]) centered in Nzara, Sudan[1] and 318 cases (280 deaths [88%]) in Yambuku (near the Ebola River), Democratic Republic of Congo[2]. The outbreak of Ebola Virus Disease (EVD) in 2014 was unlike the others. It was the 25th known outbreak and occurred in areas that were not previously the prime centers of occurrence of the disease[3]. The genus *Ebolavirus* belongs to the *Filoviridae* family, along with the genus *Marburgvirus*. There are five species of Ebola virus including Bundibugyo, Zaire, Sudan, Côte d'Ivoire (Taï Forest) and Reston ebolaviruses. The former three have been responsible for the large outbreaks that have occurred in Africa,

whereas the Reston ebola virus has been observed in animals in Asia but not as a cause of human disease[4]. Fruit bats of the *Pteropodidae* family, including the species *Hypsignathus monstrosus*, *Epomops franqueti* and *Myonycteris torquata,* are believed to be the natural hosts of Ebola viruses, with humans and other mammals serving as accidental hosts[5].Ebola virus has been spreading in an unprecedented manner not only to neighboring countries in Africa but also to many other countries worldwide. Ebola Virus Disease is a severe, often fatal illness, with a death of up to 90%[6]. According to the WHO, as on November 14, 2014, there were 14,413 reported Ebola cases in eight countries, with 5177 deaths[7]. The most recent cluster of cases in Liberia was the result of the re-emergence of Ebola virus that had persisted in a previously infected individual. Although the probability of such re-emergence events is low, the risk of further transmission following a re-emergence underscores the importance of implementing a comprehensive package of services for survivors that includes the testing of appropriate bodily fluids for the presence of Ebola virus RNA. The 8th meeting of the Emergency Committee convened by the WHO Director-General under the International Health Regulations (2005) regarding the EVD outbreak in West Africa took place by teleconference on 15 December 2015 and based on the advice of the Committee, the Director-General declared that the 2014–15 Ebola outbreak continued to constitute a Public Health Emergency of International Concern. Human-to-human transmission linked to the most recent cluster of cases in Liberia was declared to have ended on 14 January2016. Seven countries (Italy, Mali, Nigeria, Senegal, Spain, the United Kingdom, and the United States of America) have previously reported a case or cases imported from a country with widespread and intense transmission. The introduction of an EVD case into unaffected countries remains a risk as long as cases exist in any country. With adequate preparation, however, such an introduction can be contained through a timely and effective response[8]. Countries with weak health systems and few basic public health infrastructures in place cannot withstand sudden shocks, whether these come from a changing climate or a runaway virus. Also preparedness, including a high level of vigilance for imported cases and a readiness to treat the first confirmed case as a national emergency, make a night-and-day difference. Community engagement is the one factor that underlies the success of all other control measures. It is the linchpin for

successful control. Contact tracing, early reporting of symptoms, adherence to recommended protective measures, and safe burials are critically dependent on a cooperative community [9].The College of Medicine and Allied Health Sciences (COMAHS), University of Sierra Leone, the Sierra Leone Ministry of Health and Sanitation (MoHS), and the U.S. Centers for Disease Control and Prevention (CDC) are working together on an Ebola vaccine clinical trial in Sierra Leone and also known by STRIVE, which stands for the Sierra Leone Trial to Introduce a Vaccine against Ebola and are working on a vaccine named rVSV-ZEBOV, or recombinant Vesicular Stomatitis Virus *Zaire ebolavirus* vaccine[10]. Thus there is no vaccine available in the market for this disease, so stress should be made on its knowledge, attitude and practice amongst medical staff . Also India has so far been spared from the EVD, however, the subcontinent is one of the native areas of the fruit bats that are reservoirs of the disease. Fruit bats from Bangladesh have been tested serologically positive[11] . In a study where 276 bats were captured and tested in Bangladesh, where serum samples were screened for IgG, 5 of the samples tested positive for the antibody.[12] Moreover with increase in international travel, preparedness for the disease needs to be stressed upon. India being a highly populated country and lack of basic sanitary and health care facilities , India is at stake with immediate spread of the disease at a rate which would be worst than that in Africa. The present paper aims at evaluation of medical professionals regarding knowledge on preparedness and prevention towards EVD.Aim of the present study to assess knowledge and attitude regarding Ebola Virus Disease (EVD) among medical students.

MATERIALS AND METHODS

Study design : Interventional study was conducted among medical students at Adesh Institute of Medical Sciences and Research, Bathinda .
Unit of study : MBBS students including interns .
Clearance from AIMSR Research committee and Ethics committee was taken before the conduction of study and predesigned questionnaire was introduced to the participants in English both pre intervention and post intervention sessions.
Sample size : According to a study conducted on dental professionals by Meena Jain et al on Primordial Prevention: Promoting Preparedness for Ebola Virus Disease, 52.4% (n=132) of the participants had good knowledge, 44.8% (n=113) had fair knowledge and 2.8% (n=7) had poor knowledge [13] .

To calculate sample size following formula was used:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Where :   n: Sample size

d: precision (in proportion of one; if 5%, d = 0.05).

Z statistic (Z): For the level of confidence of 95%, which is conventional, Z value is 1.96

p : expected prevalence or proportion

Talking prevalence of knowledge , 52.7% according to the above study , our sample size came out to be 398.83 (400).

Each batch of MBBS course has 150 students each , which includes 1st Prof , 2nd Prof , New Final Year Part :I , New Final Year Part: II and around 100 Medical Interns. All the students were included in the study. Students who were willing to participate in the study were included and students who were absent during the time of study and those reluctant to participate were excluded from the study.The data was analyzed using MS Excel and compared using frequencies, percentages and McNemar test (to observe pre intervention and post intervention differences).

RESULTS
A total of 503 medical students including interns gave their verbal consent to participate in the study. This included 88 students from 1st prof, 109 students from second prof, 120 students from final part I and 125 students from final part II and 61 interns.95.4 % of medical students had heard about Ebola and very few 29.8% could allocate Ebola virus to its correct virus family. 62.2% of medical students knew that a Ebola virus disease could have death rate of up to 90% of the cases. No intern had a clue about this high death rate among cases. Very few of them knew correct incubation period of the virus which is 2 to 21 days and very few i.e. 35.8% knew that disease cannot be transmitted during incubation period. There was a mixed response regarding transmission of virus through semen up to 7 weeks after recovery. Many of them had misconception that Ebola can be transmitted as water borne illness (40%).82.1 % thought that Ebola could be transmitted by a person who is infected but does not have any symptoms. 54 interns out of a total of 61 thought the same. 127 out of 503 medical students that is about 25.2 %, thought that EVD can be transmitted through mosquitoes. 20.7% of the medical students thought that fever is the only symptom of Ebola virus disease. 320 students correctly identified internal and external bleeding as one of the symptoms. 307 students correctly identified all the symptoms Ebola virus disease (61%). Many students from second Prof (90 students) and most interns (58 out of 61 interns) correctly identified all the symptoms of Ebola virus disease. Scanty number of students i.e. 170 out of 503 medical students, told that twice daily fever monitoring for 21 days should be done in exposed people (12 out of 61 interns, 54 out of 125 final prof part 2, 31 out of 120 final Prof part 1, 48 out of 109 second Prof and 25 out of 88 first prof students).180 medical students out of 503 thought that vaccine for Ebola virus disease is available in the market. When asked about the definition of suspected or clinical case, only 61% of medical students answered it correctly.   Only 59.6% were able to correctly identify all the Diagnostic test for Ebola virus disease. 71.2% knew that blood or serum is to be collected for ante mortem cases. 49 out of 503 students did not know that the samples collected have to be sent to either national Institute of virology, Pune or NCDC, New Delhi. These students thought the samples collected have to be tested at the local laboratories. 102 out of 503 students thought that soap, bleach, sunlight and drying do not play any role in preventing its transmission.Surprisingly no interns knew that soap and water (hand washing) plays an important role in prevention of virus transmission. Many students 71% knew most steps of proper Hospital care during admission of a suspected case in hospital, which includes attached bathroom, wearing proper PPE, maintenance of log book and limiting use of sharp objects and syringes. Few students , 43.9%,had the knowledge of proper distance (1m) which is to be maintained between the doctor and patient.When asked about correct method of dumping waste of such patients, almost half of them(273 out of 503) correctly identified that 2 meter pit is to be dug and filled up to 1 to 1.5 meter. Only 10.5% of all medical students which includes 10 first Prof, 13 second Prof and final Prof part I, 11 final prof part II and 6 interns had knowledge that the dead bodies of such patients should not be sprayed or washed.When the students were asked about methods of contact

tracing, 43.6% (221 out of 503)had the misnomer that telephone should always be used for the same. The hand cleaning practices among the students when dealing with search patients was not up to the mark. 69 out of 503 students said that they would only wash their hands with soap and water, 64 would only use disinfectants and 22 students would all together avoid any physical contact which such patients. 348 out of 503 students sad that they would follow all these three measures if any suspected case is admitted in the hospital.Many students had a positive attitude towards patients suffering from Ebola virus disease, with as many as 70.6% students saying that they would welcome a neighbor recovering from Ebola back into their community. Surprisingly 18.9% students said that any of their known gets the disease, they would keep that information secret. Many students, 80.1%, agreed that a person should be quarantined for 3 weeks if he or she has come in contact with Ebola positive case.An intervention in the form of an interactive workshop was conducted with all the participants of the study. The intervention included detailed description of the Ebola virus disease which included its epidemiology, signs and symptoms, progression of disease, prevention and Management. An open discussion was also held so that students could have the doubts cleared. Another questionnaire was then conducted a week later after the intervention and the results were analyzed and compared with the results of pre intervention questionnaire.There was a remarkable difference in the knowledge, attitude and practice before and after the workshop. Most of the medical students, 77.1% and 89.5% , were able to tell the right incubation period and maximum case fatality rate of Ebola as compared to 27.2% and 62.2% in pre interventional questionnaire. There was a significant difference between the results regarding the knowledge of modes of transmission. After the workshop more number of students (89.3%) were able to tell that 1 m is the correct distance which has to be maintained between the interviewer and the interviewee, as compared to 43.9% in the pre interventional questionnaire. Now more students , almost about 82.3% (414 out of 503), told that twice daily fever monitoring for 21 days is required for exposed people.There was an increase in the number of students agreeing to the fact that the dead bodies of the EVD patients should not be sprayed or washed (354 students post interventional as compared to 53 out of 503 in pre

interventional) and also regarding contact tracing where now 315 out of 503 students agreed to the fact that telephone should not always be used during the contact tracing as compared to 282 earlier. There was also a change in the perception regarding prevention of transmission of Ebola virus, as shown in Figure I. More number of student agreed to that soap, bleach, sunlight and drying could prevent the transmission of the disease. More number of students now were able to identify all the signs and symptoms of the disease (Figure: I). The practice of hand cleaning plays important role in prevention of many diseases and the changes were evident when the results of pre and post interventional questionnaire were compared (Figure I). Increased number of students now know what all hand cleaning and preventive measures may be useful for preventing the transmission.
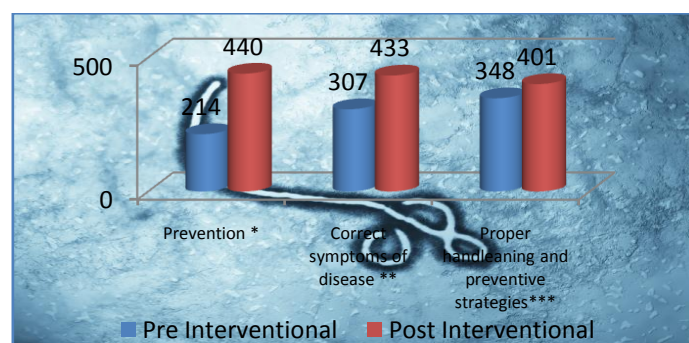

Figure I :Knowledge regarding Prevention of transmission, Pre and post interventional

Prevention* :Using soap, bleach , sunlight and drying

Correct symptoms of disease**: Fever, intense weakness , muscle pain, headache, sore throat, rash, diarrhea, internal and external bleeding.

Proper hand-cleaning strategies***: using soap and water, using disinfectants, avoiding unnecessary physical contact.

After the workshop there , there was also change in the attitude of students regarding the disease which can be seen in Table II. There was a decrease in number of students welcoming a neighbour recovering from ebola , while there was a slight increase in number of students who agreed that a person who has been in contact with Ebola positive case , be quarantined for 3 weeks.

Table I : Knowledge regarding Modes of transmission

Transmission	Pre Interventional	Post Interventional	Improvement	P-value
Transmission I (Correct response: No)	180 (35.8%)	192 (38.2%)	2.4%	p>0.05
Through Blood, body fluids (Correct response: Yes)	449 (89.31%)	491 (97.6%)	8.9%	P<0.001
From Semen 7weeks after recovery (Correct response: Yes)	258 (51.3%)	484 (96.2%)	44.9%	P<0.001
Through Water (Correct response: No)	302 (60%)	436 (86.7%)	26.7%	P<0.001
From a person with NO symptoms (Correct response: No)	90 (17.9%)	116 (23.1%)	5.2%	P<0.001
Mosquito (Correct response : No)	376 (74.8%)	470 (93.4%)	18.6%	P<0.001

Table II : Change in attitude , Pre intervention and post intervention

Attitude	Pre (Yes)	Pre (No)	Post (Yes)	Post (No)	P value
Welcome a neighbor recovering from Ebola	355 (70.6%)	148 (29.4%)	304(64.4%)	179 (35.6%)	P<0.05 (=0.040)
Keep information secret if any of your known gets Ebola	95 (18.9%)	408 (81.1%)	85 (16.9%)	418 (83.1%)	p>0.05 (=0.450)
A contact case be quarantined for 3 weeks	403 (80.1%)	100(19.9%)	433 (86.1%)	70 (13.9%)	P<0.05 (=0.017)

DISCUSSION

The study revealed a clear snapshot regarding the knowledge and attitude of medical students, who in future are going to hold various positions as medical professionals in different sectors of medicine and surgery. It was evident that almost all of the medical students had heard about the disease Ebola. Although there were only a few students who could correctly tell the incubation period of the disease. Misconceptions about how Ebola was spread were surprisingly common, particularly the belief that it could be transmitted by mosquitoes or as water borne illness. 61% of them were able to identify all the signs and symptoms of the disease. Quite a number of them thought that there is a vaccine available in the market for Ebola. There was lack of knowledge regarding the prevention of transmission of virus using soap, sunlight , drying and bleach . Moreover their behavior towards hand cleaning was lacking and also their knowledge regarding the contact tracing and dead body handling was not as good as expected. An intervention in the form of an interactive workshop was done with all the medical students and there was a significant change in their knowledge and attitude regarding the disease. Students reacted by agreeing they would welcome back survivors cautiously and also agreed to the fact that any contact case of Ebola be quarantined for 3 weeks. The study found significant demand for more information. The enhancement of this

knowledge and attitude is important as this is going to further influence the practice of medical graduates in future. The basic knowledge and development of attitude and good clinical practice guidelines are important for preparedness for the public health emergencies of emerging diseases. Although India has till now been spared from this vicious disease, the risk of cross-border transmission remains real, the importance of a basic level knowledge regarding prevention is likely to make this issue even more pressing than before. The public health significance of EVD is beyond its notoriety of causing overwhelming mortality and morbidity of infected persons, but also its potential for nosocomial dissemination. Health education regarding emerging and re-emerging diseases and infection prevention talks can also be incorporated into routine class schedules. Standard protocols should be developed and enforced to ensure uniformity of practice at health facilities. Inclusion of upcoming emerging and re-emerging infections sensitization in the curriculum of subject of Community Medicine and general Medicine should me stressed upon.

CONCLUSION AND RECOMMENDATIONS

The enhancement of this knowledge and attitude is highly significant as this is going to further influence the practice of medical graduates in future. The basic knowledge and development of attitude and good clinical practice guidelines are important for preparedness for the public health emergencies of emerging diseases. This calls for a day to day updating of the curriculum in Community Medicine and General Medicine as well as other relevant teaching and training of Interns in medical colleges.

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