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Research Article

Knowledge about an emerging disease: Ebola viral fever, among medical professionals in a medical college, South India

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ABSTRACT

Background: Knowledge among health care professionals of any emerging disease, with a potential of causing high morbidity and mortality, is vital to diagnose and manage suspect cases, to prevent transmission and control an outbreak of the disease. This study attempts to assess the essential knowledge of medical professionals in a teaching hospital in South India about key aspects of an emerging disease: Ebola Viral Fever.
Methods: A cross-sectional study using structured, pre-tested questionnaire in a tertiary care Medical College Hospital in South India was conducted in January 2015. Analysis was done using Epi Info 7 and SPSS 16.
Results: Only 6% of the respondents in the study had a good knowledge score, while 72% had moderate knowledge and in 22 % the knowledge was inadequate. The knowledge scores were not based on 'must know' essential facts of EVF, which included early diagnosis of suspect cases, appropriate management of diagnosed cases and measures to prevent transmission. This knowledge deficit of essential facts was statistically significant ($p<0.001$). 86% of the respondents reported print and electronic media as their source of information. Official and government circulars were quoted by only 14%.
Conclusions: The result reveals insufficient knowledge among health professionals about an emerging disease, at a time when it was perceived as an emergency of global importance. This is a pointer to the policy makers in conducting regular Continuing Medical Education sessions and maintaining an effective surveillance system.

Keywords: Knowledge, Ebola viral fever, Emerging disease, Medical professional

INTRODUCTION

Preparedness of the health care delivery system is the strongest defence of any country against an emerging virulent disease. This involves not only ensuring availability of necessary supplies, but also adequate knowledge levels of medical professionals about the disease. The recent outbreak of Ebola had been declared as a Public Health Emergency of International Concern by the WHO Director-General, on 8th August 2014. The 'Bio-preparedness Act' included Ebola virus as one of the "Tier 1" agents, the subset with greatest potential for mass casualties[1]. However, the medical professionals of many countries still remained complacent.

This study was aimed to assess the knowledge of medical professionals about different epidemiological characteristics of Ebola Viral Fever and measures to prevent an outbreak.

METHODS

A cross-sectional study of medical professionals of a tertiary-care Medical College in South India was carried out in January 2015.

A questionnaire, with relevant data from WHO[2] and CDC[3] notifications, was prepared and pretested on a sample of 5 doctors in different hospitals, quite a distance

away from the proposed study area. The answers were filled by the respondents in the presence of the interviewers. Based on the responses; appropriate changes were made in the content and size of the final questionnaire. The final questionnaire had 28 questions, which were framed in such a way that 14 were 'must know' essential knowledge facts and the rest were 'nice-to-know' knowledge of EVF. This categorization was used only during analysis and was not apparent to the respondents. As far as possible, any cross-reference between questions was avoided.

To increase the internal consistency, the questions were grouped into key categories:

1. Etymology, Geographical location of outbreak
2. Agent factors like virulence, multiplication and reservoir of infection
3. Epidemiological factors like, Incubation period, mode of transmission, period of infectivity
4. Early detection of suspect cases of Ebola
5. Management of suspects and confirmed cases, including Notification procedures, and current treatment available
6. Knowledge of Personal Protective Equipment and its effective use.

The questions were multiple choices with only one correct answer. The option of "do not know" was added to some questions. The last question in the list regarding 'Source of knowledge' was open-ended.

The list of the medical faculty in the major specialties of the Medical College was procured from the Office of the Registrar. A 20% proportionate representation from each department was taken, which gave a sample size of 50 respondents.

A team of 8 volunteers distributed the questionnaires to the respondents who were contacted at their convenience, at intervals during various departmental activities. A written informed consent was obtained from the respondents after explaining the purpose of the study and assuring them of confidentiality. The respondents were kept under discrete observation while they answered the questionnaire to avoid any reference to hand-held devices, internet, or other materials.

Since it was a knowledge study of a small community we restricted the data collection to a single day. This was to eliminate any discussion or exchange of information between the respondents that might affect their responses to the questions.

The adequacy of the questionnaire was post validated by item analysis with reference to the Facility value, Discrimination index and Distractor efficacy of the questions.

Each correct answer was given a score of 1, bringing the maximum total score to 28/28. According to the correct answers, the respondents were divided into 3 knowledge groups:

Good knowledge: Scores 18 and above;
Moderate knowledge: Scores between 9 and 17;
Inadequate knowledge: Score8 or less.

To assess the grade of essential knowledge of the respondents, we further divided them into two groups, on the basis of their scores of the 14 'must know' knowledge facts included in the questionnaire:

1. Those who scored ≤7/ 14 and
2. Those who scored ≥8/14.

Analysis was done using EPI Info7 software and SPSS 16.

RESULTS

In our study, 6% of the respondents had good knowledge about Ebola Viral Fever, 72% had moderate knowledge, whereas in 22 % the knowledge was inadequate (Table 1).

Only 18% of the respondents had high scores of 'must know' knowledge facts needed in detecting and preventing transmission of EVF [Statistically significant $p< 0.001$], of which 72% and 6% where in the categories of moderate and good knowledge levels respectively (Table 2).

We further analysed the data to know the lacunae in the knowledge regarding this emerging disease.

Table 1: Knowledge level of respondents about Ebola viral fever.

Knowledge level	Frequency	Percent	Mean	SD	Minimum	Maximum
Inadequate	11	22.0	11.92	3.35	5	19
Moderate	36	72.0				
Good	3	6.0				

Etymology of Ebola, areas affected by current outbreak

64% of the respondents knew the etymology of Ebola, but only 36% knew that the countries mainly affected by the current outbreak.

Agent factors

52% of the respondents were aware that the Ebola virus belonged to the Filo virus family and 60% knew that fruit bats were the main reservoir of infection.86% had no knowledge of the extremely high multiplication of the virus and 36% were unaware of high human susceptibility due to its extreme virulence (Figure 1(a)).

Table 2: Knowledge scores of 'Must know' facts.

Knowledge level	'Must Know' knowledge scores		p value
	< 7 {n (%)}	7-14 {n (%)}	
Inadequate	11(22)	0	
Moderate	30(60)	6(12)	0.000
Good	0	3 (6)	
Total	41(82)	9(18)	

While 74% knew the modes of transmission of EVF, 62% did not know the incubation period or its importance. 72% were not aware when an Ebola patient would become infectious and 86% did not know that patient would continue to be infectious long after symptomatic recovery. Only 2% knew about the period of monitoring the health of contact of Ebola patient (Figure 1(b)).

Early diagnosis

58% of the respondents knew that the EVF could mimic Coryza in its initial presentation. However, only 32% of the respondents could correctly identify a suspect case of EVF according to the WHO classification of symptom complex, out of a list of symptom complexes of other diseases including Leptospirosis, Severe Acute Respiratory Syndrome, Malaria, Acute Encephalitis and Gastroenteritis (Figure 2). Though 78% of the respondents knew the importance of eliciting travel history in cases with fever, their knowledge scores of other 'must know' essential facts of EVF was low (Table 3).

Table 3: Knowledge of importance of travel history versus 'Must-know' score.

		"Must know" knowledge Score		Total n (%)
		<7	7-14	
Importance of travel history	Don't Know	11	0	11 (22%)
	Know	30	9	39 (78%)
Total		41	9	50 (100%)

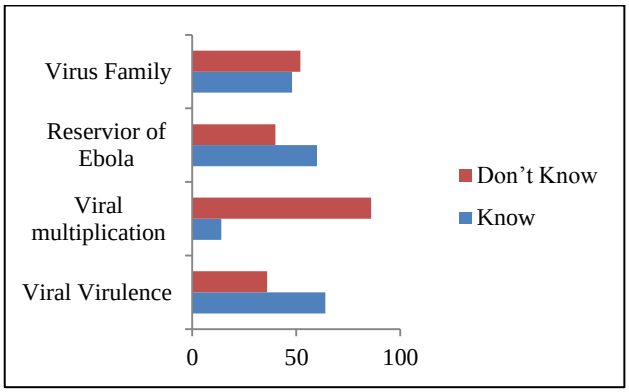

Figure 1(a): Knowledge (%) about agent factors.

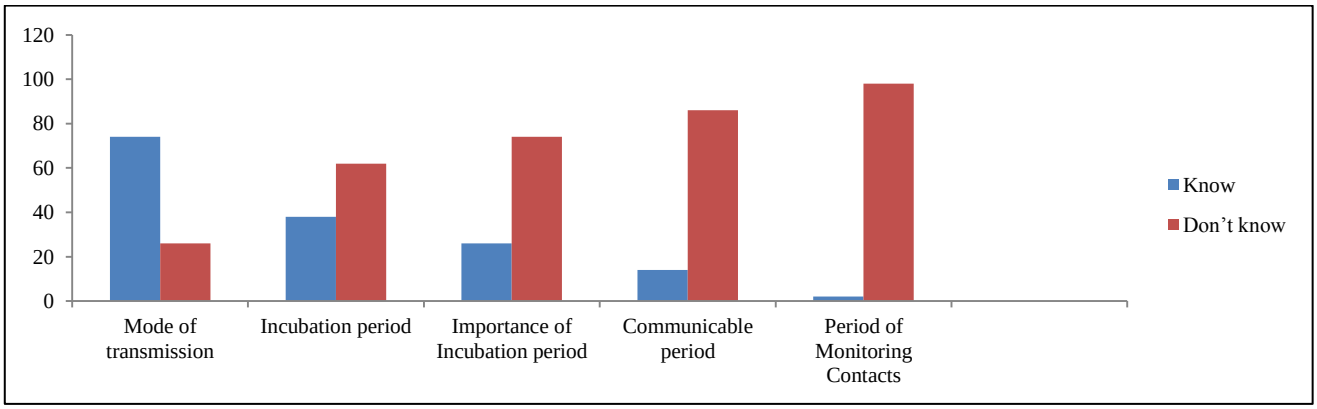

Figure 1(b): Knowledge (%) about agent factors.

Management

70% of respondents knew the initial management of suspect case of EVF in the out-patient settings, but only 34% knew the subsequent proper management of confirmed cases. 58% of respondents were aware of notification procedures in the management of an apparently healthy person with positive contact history to EVF, though 98% had no knowledge of the period of monitoring a healthy contact. 66% of respondents knew that no vaccine was available till date, while only 28% knew about the role of treatment with 'Convalescent' plasma/serum and new drugs under trial (Figure 3).

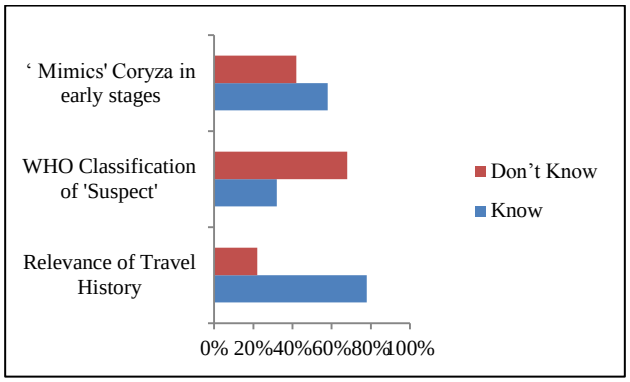

Figure 2: Knowledge of WHO classification and travel history.

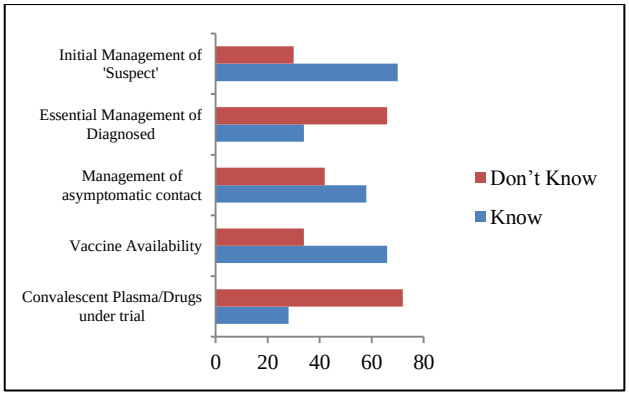

Figure 3: Knowledge (%) of management of EVF cases/contacts.

Personal protection equipment

Only 36% of the respondents knew the importance of using complete Personal Protection Equipment (PPE) by the health care provider, and 42% knew that Ebola virus could not breach a complete PPE. Out of different situations offered in the questionnaire concerning proper use of PPE, only 24% of the respondents could correctly identify 'known' risk to the health giver of an Ebola patient. 90% of the respondents did not know the indications when a complete PPE needed to be used by the health care provider (Figure 4).

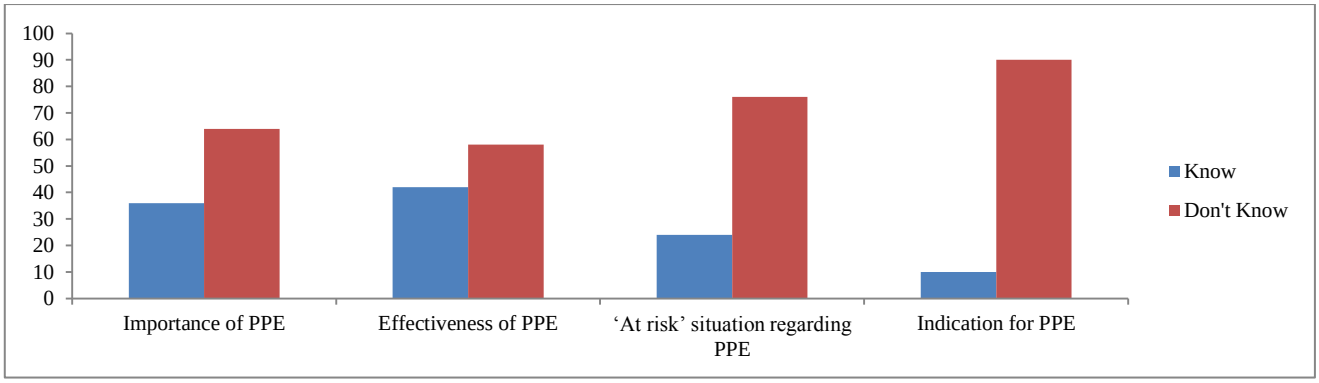

Figure 4: Knowledge (%) about personal protection equipment in EVF.

Source of information

58 % of the respondents in our study reported print and audio - visual media, comprising of newspapers/magazines/radio and television as the source of information, whereas 28% quoted the web pages on the internet. Only 12% relied on medical journals and Continuing Medical Education programs for their source of information, while 2% had seen circulars from the Government departments of Medical and Health pertaining to EVF (Figure 5).

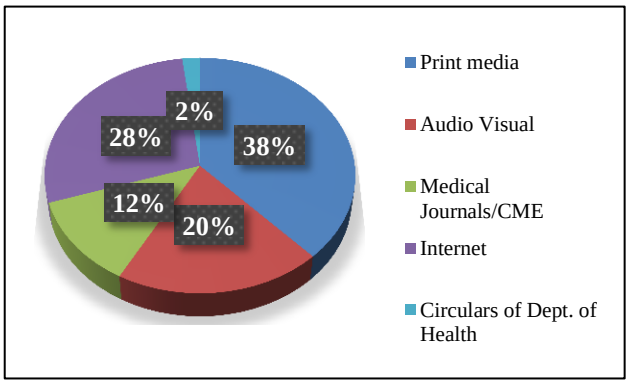

Figure 5: Source of knowledge of EVF.

DISCUSSION

The threat of emerging diseases will always exist, since we share the earth with microbial cohabitants. WHO, in their topical discussion on 'Emerging diseases' has stressed the importance of disease-specific knowledge in containing potential outbreaks.[4] In a hospital based study about 'Physician Awareness of Chagas' disease, USA' it was noted that substantial knowledge deficits among physicians about an unfamiliar disease would impinge on control measures.[5] The recent flare-up of the Ebola outbreak was fuelled by misdiagnosed initial cases and lack of awareness of the disease among Guinea health officials.[6] On the other hand, timely control of an Ebola outbreak in Uganda was reported through good surveillance, rapid response of local staff capable of identifying suspect cases and reporting through the public health system.[7] One of the factors that would heighten fear and panic in a population faced with the threat of an outbreak of any emerging disease is the public perception that front-line health professionals lack adequate information.[8] In this study, an attempt was made to assess the essential knowledge of medical professionals in a teaching hospital about the key aspects of an emerging disease: Ebola Viral Fever.

Only 6% of the respondents had good knowledge about Ebola Viral Fever. Though 72% of respondents had moderate knowledge, they did not have adequate 'must know' scores, ($p<0.001$), which suggests that their information was incomplete and fragmented. Essential knowledge of an emerging disease is crucial for rapid and efficient response by the medical professionals when confronted with an impending outbreak.

64% of the respondents knew the 'nice to know' fact that Ebola is named after a river, after it was first recognized in 1976 in Democratic Republic of Congo.[3] However, only 36% of the respondents knew that Guinea, Sierra Leon and Liberia in West Africa were the countries mainly affected by the current outbreak.[8] This 'must know' fact is important for eliciting travel history. Though 78% of the respondents were aware of the importance of eliciting travel history in cases with fever, this was fragmented knowledge, as other 'must know' facts were not elicited in their responses to subsequent questions.

The 'nice to know' facts of the name of the virus and the main reservoir of infection was known to more than 50% of the respondents. However, 86% had no knowledge of the "must know" facts of the danger of the extremely high multiplication of the virus and 36% were unaware of its high virulence in attacking even robust people with healthy immune system.

While 74% knew the modes of transmission, 62% did not know the incubation period or its importance. 72% were not aware when an Ebola patient would become infectious and 86% did not know that patient would continue to be infectious long after symptomatic recovery.

The critical 'must know' knowledge of the incubation period and communicable period of EVF was lacking in 62% and 72% of the respondents. The wide range (2-21 days) of incubation period assumes importance in spread of the disease to distant places and in establishing the period of monitoring the health of contact of an Ebola patient. The very fact that the patient becomes communicable only from the onset of clinical symptoms and continues to be infectious for a long period even after recovery is vital in control measures.

In case of an impending outbreak, the health care professionals need to maintain a high degree of suspicion and must possess critical "must know" knowledge of early diagnosis and management of both suspect or identified patients of EVF, proper use of Personal Protection Equipment (PPE), and procedure for notifying relevant health authorities.[3]

30% of the respondents in the study did not know the danger of initiating invasive procedures in a suspect case of EVF like taking blood samples for laboratory diagnosis. This would pose a high risk to the unprotected health provider by bringing him in contact with body fluids of the patient.

Though 70% knew the importance of isolation of suspect cases, only 34% of the respondents knew the subsequent proper management of confirmed cases with volume repletion, maintenance of oxygen and blood pressure and management of co-morbidities.

Only 36% of the respondents knew the importance of using complete Personal Protection Equipment (PPE) by the health care provider, and 90% of the respondents did not know the indications when a complete PPE needed to be used by the health provider. This is important when there have been cases reported among health provider due to improper or careless use of PPE.[2]

Ebola Viral Fever is a 'centre-stage' disease, which had attracted increased media attention, both print and visual. The dramatic aspects of the disease splashed on popular media had contributed to the public awareness. 58 % of the respondents in our study also attributed their knowledge of EVF to print and audio-visual media. AV aids were the most important source of information about EVF in a study among private dental professionals in a tri-city study, India.[9] However, for the front-line health care professionals, this is not enough and essential knowledge of an emerging disease is critical for effective control of an outbreak.

CONCLUSION

Our study shows that there are gaps in critical knowledge about an emerging disease among health professionals, which need to be plugged. A knowledge deficit, even

fragmented knowledge, especially among the health professionals, can jeopardize the health security of a thickly populated country like India.

Though our study was limited by a relatively small sample size, such studies on a larger scale among health care professionals in different clinical, community and other settings would help in identifying critical knowledge gaps of an emerging disease, and help in developing clear messages for continuing medical education.

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