

## SHORT COMMUNICATION

# Assessing Knowledge of Zika Virus and a need for Continuous Medical Education (CME) in Post-Graduate Doctors of a Tertiary Care Hospital: A Single Center Experience

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### ABSTRACT

**Background:** The 2015-2016 Zika Virus Outbreak caused global concern. A study was done to assess knowledge about viral hemorrhagic fevers amongst healthcare professionals, which found only 57% doctors knew clinical features of hemorrhagic viral fever. The aim of this research was to assess the knowledge of physicians as well as the need for continuous medical education.

**Methods:** A cross-sectional study was conducted on doctors working or undergoing postgraduate training in a private tertiary care hospital. A sample size of n=91 was reached after including most of the doctors working in these hospitals in the department of medicine, pediatrics, gynecology and obstetrics. Data was collected through self-administered questionnaire. Convenience sampling technique was employed. Informed oral consent was taken before administration of questionnaire. Analysis was done on SPSS version 20.

**Results:** The doctors included in the study were from the departments of internal medicine, which were 46.2% (42), pediatrics, which were 19.8% (18), and gynecology and obstetrics. Only 17.6% (n=16) participants knew that the Zika virus can affect pregnant women in any trimester. If pregnant woman is infected only 65.9% (n=60) of all doctors were aware of the fact that it can cause microcephaly in the infants. Thus, 44% (n=40) of the participants demonstrated correct knowledge that Zika virus is associated with the Guillain-Barré syndrome (GBS).

**Conclusion:** Our study determined that although many doctors demonstrated good knowledge regarding the clinical features of Zika virus, they had poor knowledge regarding the prevention of spread of disease.

**Keywords:** Zika Virus; Epidemic; Knowledge; Doctors.

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### INTRODUCTION

The 2015-2016 Zika Virus Outbreak was an epidemic, which caused global concern<sup>1</sup>. The outbreak was centered in Brazil with the number of confirmed cases reported to be 223,336<sup>2</sup>. Zika virus is also associated with congenital malformations, most commonly microcephaly with the number of cases

of congenital syndrome associated with Zika virus to be 3,715<sup>2,3</sup>. It primarily spreads via mosquitoes including species *Aedes aegypti* and *Aedes albopictus*, as well as sexually and materno-fetal<sup>4</sup>. According to a case-control study, Zika virus has a causal association with Guillain-Barré syndrome<sup>5</sup>. In 1982 Zika virus was isolated from a serological survey in Pakistan, however a lack of a national, unified

arbovirus surveillance system may contribute to making it harder to detect the virus<sup>6</sup>. A qualitative analysis on people arriving via flights to Pakistan found that a proportion of passengers originated from 23 Zika infected countries as of 1 September 2016<sup>6</sup>.

A study in Israel concluded that Continuous Medical Education (CME) might have contributed to an improvement in quality of care and physician skills<sup>7</sup>. Similarly, a study in Croatia reported a decrease in improper management, time before reaching diagnosis, referrals to other specialists in patients and misdiagnosis with iron deficiency anemia seen by general physicians following the use of CME<sup>8</sup>. Continuous Medical Education is also undergoing changes in the way it may be implemented with the introduction of online and Self Assessment-Continuous Medical Education (SA-CME)<sup>9,10</sup>. A cross-sectional study on general physicians in Karachi found that only 52% of them had attended a CME session<sup>11</sup>. A study was done to assess knowledge about viral hemorrhagic fevers amongst healthcare professionals, who found out only 57% doctors knew about signs and symptoms of hemorrhagic viral fever<sup>12</sup>. A study done regarding Crimean-Congo hemorrhagic fever among healthcare professionals found out that 80% doctors knew the most common presentation of the disease, however all of the respondents had poor knowledge regarding the burial procedure of dead patients<sup>13</sup>.

The aim of this study was to identify how well rehearsed physicians of a private tertiary care hospital were regarding modern-day epidemics. For this study, we used the outbreak of Zika virus. Secondary aims were to understand how well physicians follow medical epidemics and to identify the need if any for CME sessions.

## METHODS

A cross sectional study was conducted on doctors working in a tertiary care hospital in Karachi. All together, three teaching tertiary care hospitals of a single institute (Dr. Ziauddin Hospital) were selected for the research study. We determined our target population to be all physicians working above the level of interns in the department of internal medicine, pediatrics, gynecology, and obstetrics that is post-graduate trainees, medical officers, and consultants. Doctors excluded from the study were interns and health care professionals who are not physicians. Sampling technique employed was cluster-sampling technique. Sample size came out to be 91 as all physicians working in this institute and who consented were included. This study was conducted for a period of four months from August 2016 until November 2016.

Data was collected through self-administered

questionnaire filled in front of researchers. Informed oral consent was taken from participants before administration of the questionnaire. No time constraint was placed on them. They were not allowed to use any source of information while filling the questionnaire. In the questionnaire, doctors were asked about clinically significant information about Zika virus for example, its vector, mode of transmission, complications, and its complication in pregnancy to the fetus and which trimester of pregnancy is most susceptible to it. They were given a list of many symptoms which included both the correct and the incorrect symptoms and they were asked to choose the ones with which the patient who is infected with Zika virus could present with. In addition, they were asked to choose the correct management options for the patient who has been infected with Zika virus.

All information gathered from the participants was kept confidential. In addition, permission from administration of each hospital was taken before conducting a study in their hospital. The Ethical Review Board of hospital approved this study. Data was analyzed on SPSS version 20. All qualitative variables are presented as frequency and percentages and all quantitative variables are presented as mean and standard deviation. Chi-square test was used to find association between categorical variables and a p-value less than 0.05 was considered as significant.

## RESULTS

A total of n=91 participants were included in the study, out of which 24.2% (n=22) were males and 57.1% (n=52) were females. The doctors included in the study were from the departments of internal medicine which were 46.2% (n=42), pediatrics which were 19.8% (n=18) and gynecology and obstetrics which were 25.3% (n=23). In our sample population, 54.9% (n=50) were postgraduate students (residents), the rest were registrars (7.7%), medical officers (19.8%) or consultants (7.7%).

The participants were asked about the trimester of pregnancy in which the female is most susceptible to Zika virus infection and only 17.6% (n=16) participants were able to correctly answer that it can affect in any trimester. Unfortunately, none of them was from the pediatrics department, 50% of them were from internal medicine and 50% were from gynecology and obstetrics.

The participants were also asked about the complications that can be seen in a child born to a woman who has been infected with Zika virus during her pregnancy and most of the doctors that is 65.9% (n=60) of them were aware of the fact that it can cause microcephaly in the infants. Also out of all the doctors from pediatrics department, 72.2% (n=13 out of n=18) had knowledge of this common

complication of Zika virus.

When asked that which neurological disease has the highest association with the Zika virus, only 44% (n=40) of the participants demonstrated correct knowledge that it is Guillain-Barré syndrome (GBS). Unfortunately only 52.4% (n=22 out of n=42) internal medicine doctors were aware of it.

The participants were also asked that which endemic disease in Pakistan shares the same vector as Zika virus, and 51.6% (n=47) correctly identified it to be dengue while 34.1% (n=31) incorrectly choose Congo hemorrhagic fever as

their answer. The doctors from internal medicine department had the highest percentage 54.8% (n=23 out of n=42) who correctly answered this question. Then the participants were asked whether this virus can be transmitted sexually and only 19.8% (n=18) doctors had correct knowledge that it can be transmitted via sexual contact while unfortunately 46.2% (n=42) said that this cannot be transmitted and 33% (n=30) did not know the answer. Since, 1 (1.1%) doctor chooses not to answer this question. The correct sign and symptoms and the percentage of doctors who were able to identify them are shown in Table 1 below:

**Table 1: Sign and symptoms of Zika Virus and the percentage of doctors who were able to correctly identify it and those who could not.**

Sign and Symptoms	% of Doctors who were able to correctly identify	% of Doctors who were not able to correctly identify
Malaise	71.4	28.6
Maculopapular rash	58.2	41.8
Conjunctivitis	38.5	61.5
Joint swelling	18.7	81.3
Fever	67	33
Arthritis	22	78

The participants were also asked about how they will manage a patient travelling to their country from an area that has an epidemic of Zika virus. The

correct options and the percentages of doctors who were able to identify them and those who were not are given in Table 2 below:

**Table 2: Correct management options of Zika virus and the percentage of doctors who answered them correctly and incorrectly.**

Correct Management Options	% of doctors who were able to correctly identify	% of doctors who were not able to correctly identify
Advise them to avoid sexual contact	23.1	76.9
Advise them to avoid pregnancy	41.8	58.2
Quarantine	24.2	75.8

**DISCUSSION**

Zika virus is notorious for its teratogenicity during pregnancy. It is an exanthematous disease related to dengue fever. The vector involved in both the

diseases is the *Aedes aegypti* mosquito predominantly but other form of *Aedes* species are also involved in the transmission of the disease. Only about 51.6% of the doctors who participated in the study were aware of the fact that the disease is

related to dengue and is transmitted by the same vector<sup>14</sup>. A study in Colombia showed that probability of infection occurring during the first trimester was about 4%, 43% for the second trimester, and 54% for the third trimester. While our study found out that 65% of the health care workers thought that, the infections occur during the first trimester, 12.1% for the second, and only 2.2% for the third trimester, which is actually completely the opposite of the actual results<sup>15</sup>. Only 17.6% of the doctors correctly said that the infection could actually occur in any trimester.

In regards to the knowledge of the initial presenting complains of a patient, there was a study conducted in Colombia. That showed that the most consistent symptom seen in infected patients was rash, which was present in about 71% of cases but our study showed that only 58% of the health care workers thought that rash could be a presenting complain<sup>15</sup>. In addition, the same study showed that fever was seen in 46% of the infected patient but our study found out that about 67% of the health care workers thought that fever would be the presenting symptom<sup>15</sup>. While joint pain was present in about 39% of the cases, compared to our study, which showed, only 18.7% of the doctors thought this would be a presenting complain<sup>15</sup>. These various statistics shows that the information regarding the initial presenting complaints is considerably low and therefore further intervention needs to be done for example workshops to increase the awareness in the health care providers for this disease and other communicable diseases that can or are causing outbreaks in different areas of the globe.

Regarding the complications associated with the Zika virus infection, a study conducted in Brazil in 2015 showed that 35% of the cases of microcephaly were reported and comparing this to our study 65.9% of the doctors were aware of this fact that microcephaly could be a complication in a child born to a women with a Zika virus infection<sup>14</sup>. Although it has been confirmed that Guillain-Barré syndrome (GBS) is a neurological disease associated with the Zika virus infection, but our study found that only 44% of the doctors were aware that GBS is a complication of Zika virus infection<sup>14</sup>. There is some evidence of the disease transmission by sexual contact and blood transfusion because the virus has been isolated from the blood, semen, urine, and 76% of the doctors said that they would not advise the patients to avoid sexual contact. Therefore, it seems that a large number of doctors have poor knowledge of the way through which the disease could be transmitted.

Zika virus without doubt is one of those diseases that are a cause of concern in the field of medicine. Its recent outbreak in South America has cause a high

alert in countries where *Aedes* mosquito is endemic. Therefore, if an outbreak occurs in highly populated countries like India, China and Pakistan, it will be impossible to control this disease. Moreover, because of the globalization of the vector, virus can land anywhere through any route<sup>4</sup>. While assessing the knowledge of the doctors regarding this disease it shows that health care professionals need significant improvement in this subject. The recent outbreak in various parts of the globe has made its understanding even more vital so that significant efforts must be taken to counter its harmful effects. Therefore, it is time that we conduct different researches and launch different seminars and CMEs to educate the doctors and the public health sectors regarding this virulent disease and the way to counteract this threat.

The limitation of our study is that our sample size is small as we were targeting the doctors of specific departments in all the branches of a specific institution. More researches need to be done with large samples, which include doctors from multiple institutions, which determine the knowledge of health care professionals in other communicable diseases also.

## CONCLUSION

Our study determined that there is much need for improvement in knowledge of doctors regarding the current epidemic diseases as health care professionals should not only update themselves about the epidemic diseases in their country. But the diseases that are spreading rapidly in other parts of world because although the organism may be different but due to same vectors and increased frequency of people travelling to and fro from these countries, diseases can rapidly cross borders and health care professionals as well as hospitals always need to be prepared for such a situation.

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## CONFLICT OF INTEREST

There was no conflict of interest among the authors.

## ETHICS APPROVAL

The study approval was sort from the Dr. Ziauddin Hospital ethics committee.

## PATIENT CONSENT

All participants were informed at the time of data collection.

**AUTHOR'S CONTRIBUTION**

All authors contributed to the study design, data collection, and data analysis and manuscript approval.

**REFERENCES**

1. Heukelbach J, Alencar CH, Kelvin AA, De Oliveira WK, de GóesCavalcanti LP. Zika virus outbreak in Brazil. *J Infect Dev Ctries*. 2016;10(02):116-20.
2. PAHO. 21 December 2017. Zika cases and congenital syndrome associated with Zika virus reported by countries and territories in the Americas, 2015-2017 Cumulative cases. [www.paho.org](http://www.paho.org)
3. Rather IA, Lone JB, Bajpai VK, Park YH. Zika virus infection during pregnancy and congenital abnormalities. *Front Microbiol*. 2017;8.
4. Musso D, Gubler DJ. Zika virus. *Clin Microbiol Rev*. 2016;29(3):487-524.
5. Cao-Lormeau VM, Blake A, Mons S, Lastère S, Roche C, Vanhomwegen J, et al. Guillain-Barré Syndrome outbreak associated with Zika virus infection in French Polynesia: a case-control study. *Lancet*. 2016;387(10027):1531-9.
6. Darwish MA, Hoogstraal H, Roberts TJ, Ahmed IP, Omar F. A sero-epidemiological survey for certain arboviruses (Togaviridae) in Pakistan. *Trans R Soc Trop Med Hyg*. 1983;77(4):442-5.
7. Twig G, Lahad A, Kochba I, Ezra V, Mandel D, Shina A, et al. The effect of a tailor-made continuous medical education program for primary care physicians on self-perception of physicians' roles and quality of care. *Israel Med Assoc J*. 2010;12(9):521-5.
8. Batinac T, Petranović D, Duletić-Načinović A, Trošelj-Vukić B, Jelovčić-Barbić B. Significance of continuous medical education of general practitioners about common diseases—iron deficiency anemia. *Coll Antropol*. 2009;33(4):1191-6.
9. Thepwongsa I, Kirby C, Schattner P, Piterman L. Online continuing medical education (CME) for GPs: Does it work?: A systematic review. *Aust Fam Physician*. 2014;43(10):717.
10. Talanow R. A new interactive approach to Continuous Medical Education (CME) *Journal CME. J Radiol Case Rep*. 2014, 8(1):47-48
11. Ali SA, ulFawwad SH, Ahmed G, Naz S, Waqar SA, Hareem A. Continuing medical education: a cross sectional study on a developing country's perspective. *Sci Engineer Ethics*. 2017;27:1-0.
12. Lakhani A, Mahmood H, Laeeq A, Mansoor S, Lodhi S, Majid S, et al. Viral hemorrhagic fever in Pakistan: awareness among health care personnel. *JPMA*. 2002;52(5):214-7.
13. Sheikh NS, Sheikh AS, Sheikh AA. Knowledge, attitude and practices regarding Crimean–Congo hemorrhagic fever among healthcare workers in Balochistan. *Headache*. 2004;30:20.
14. Paixão ES, Barreto F, da Glória Teixeira M, Maria da Conceição NC, Rodrigues LC. History, epidemiology, and clinical manifestations of Zika: a systematic review. *J Inform*. 2016;106(4).
15. Villamil-Gómez WE, Mendoza-Guete A, Villalobos E, González-Arismendy E, Uribe-García AM, Castellanos JE, et al. Diagnosis, Management and Follow-up of Pregnant Women with Zika virus infection: A preliminary report of the ZIKERNCOL cohort study on Sincelejo, Colombia. *Travel Med Infect Dis*. 2016;14(2):155-8.

