



ORIGINAL ARTICLE

Evaluation of knowledge, attitude and perception towards zika virus among students and young generation: A cross sectional study

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Abstract

A new mosquito transmitted virus is rapidly spreading across the Caribbean and the Americas. Cases are also reported among travelers who are returning to the United States. Zika Virus (ZV) outbreak is proliferating across various countries and territories like Mexico, Venezuela, Brazil, Puerto Rico and Panama. In Pakistan, younger generations are targeted. It has been associated with increasing reports of birth defects such as babies with small heads and paralysis in adults. *Aedes aegypti* mosquito bites transmit the virus. No specific drug or vaccine is available yet for the treatment. The prospective, cross sectional study was conducted by the medical professional students of Jinnah University for Women to investigate the level of understanding, attitude, knowledge and risk perceptions regarding ZV. The electronic version of self-administered online questionnaire was made available to study participants on Google form. As the responses were reported by sample size of 100 participants, the data was collected and analyzed by using the statistical package for social software (SPSS). The clear majority of respondents were females (73.2%) as compared to male (26.8%) under the age group of 18-30 (95.2%), 31-40 (2.8%), and 41-50 (52%). A significant number of young generations have no idea about Zika virus. The results of current study exhibited awareness about ZV and its treatment guidelines, methods of its transmission and understanding and knowledge about ZV in participants. Recently offered curriculum in various health care institutions should provide correct information regarding ZV.

Keywords

Zika virus
Attitude
Knowledge
Curriculum
Respondents

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Introduction

Zika Virus (ZV) has emerged as most dangerous disease these days. It is a mosquito produced flavivirus. Zika virus is a single stranded and positive sense RNA Virus having a 10.7 kb genome, encoding a single poly-protein that is further cleaved into three structural protein units (C, E, prM/M) and seven non-structural protein units (NS1, NS2A, NS2B, NS3, NS4A, NS4B and NS5) (Lindenbach and Charles, 2003). For the first time, it was identified in monkeys (Uganda 1947) via a network that monitored yellow fever there. Later, it was identified in humans in 1952 in United Republic of

Tanzania and Uganda. Zika virus disease outbreak has been recorded in America, Pacific, Asia and Africa. From 1960s to 1980s infections in humans were reported across Asia and Africa that were accompanied by mild to moderate illness and they were classified into two genotypes, Asian and African by sequence analysis (Dick et al 1952). In humans Zika virus infection causes typical Zika fever which is a mild and self-limiting illness (Ioos et al., 2014). It is accompanied by headache, myalgia, maculopapular rash and conjunctivitis. Human infection occurs mainly via the bite of various species of *Aedes* mosquito including *Aedes albopictus* and *Aedes aegypti*. WHO

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has declared this epidemic the most concerned and an emergency disease mainly due to its increased prevalence between countries which is resulting in various birth defects such as microcephaly and many others? It is also being associated with Guillain-Barresyndrome (Oehler et al., 2014).

Most likely ZV is maintained in a sylvatic cycle that involves non-human primates and mosquitos (Shawan et al., 2015). Cyclic epizootics in monkeys was reported in Uganda (Kaddumukasa et al., 2015). Humans serve as incidental hosts in case of sylvatic transmission cycles. Human presumably serves as a primary amplification host and potential reservoir host, in areas without non-human primates, if their viremia is sufficient in magnitude and duration (Bueno et al., 2016).

Though it is suggested that enzootic ZV transmission primarily takes place through a mosquito/monkey transmission cycle yet antibodies have also been detected now in various other animal species like elephants, hippo, water buffalo, goats, kongoni, sheep, lions, rodents, wildebeest, zebras and impala (Haddow et al., 2012).

For public health readiness, it is important to identify the regions and times where the possible, social, economic and health effects of ZV are greatest. Focus is needed on resource limited countries like Asia-Pacific and Africa regions (Duffy et al., 2009). Current research was conducted to evaluate the knowledge, attitude and understanding of young people because very meagre literature from Pakistan is available regarding the study of understanding, knowledge and attitude perspectives about ZV.

Materials and Methods

A prospective, cross sectional study was conducted by the electronic version of self-administered online questionnaire which was made available to study participants on Google form, the duration of survey was one month twenty days. Current study was ethically permitted and approved by Dean of Pharmacy. The targeted audience was mostly from Jinnah University for Women. The data collected from medical and non-medical staff from which we have exclude the non medical staff. The participants were among the urban and rural areas with different professions and different age groups. A sample size of 100 participants participated in filling the forms which was comprised of two sections. Section A consisted of sociodemographic data which was comprised of 6 questions while section B consisted of awareness of zika virus which was comprised of 10 questions. Convenience sampling was used to approach the participants. Data were taken and recorded anonymously and the confidentiality of respondents was respected. Data was collected and then

analyzed by using version 20 of SPSS. We evaluated the knowledge and information about the Zika virus among the young generation of Pakistan.

Results

Table 1 Shows the practice of sociodemographic data in which majority of young generations responds were of female (73.2%) as compared to male (26.8%), under the age groups of 18-30(95.2%), 31-40(2.8%), and 41-50 (52%), with married (14.3%) and unmarried (85.7%) marital status. The responses were predominant from urban side (56.1%) as compared to rural side (43.9%).

Table: 1 “Sociodemographic data”

Sr. No	Characteristics	Percentage
1	Gender	
	Male	26.8%
	Female	73.5%
2	Marital status	
	Married	14.3%
	unmarried	85.7%
3	Age group	
	18-30	95.2%
	31-40	2.8%
	41-50	2%
4	Residence	
	Rural	43.9%
	Urban	56.1%
5	Do you have children less then 5yrs?	
	Yes	7.5%
	No	92.5%

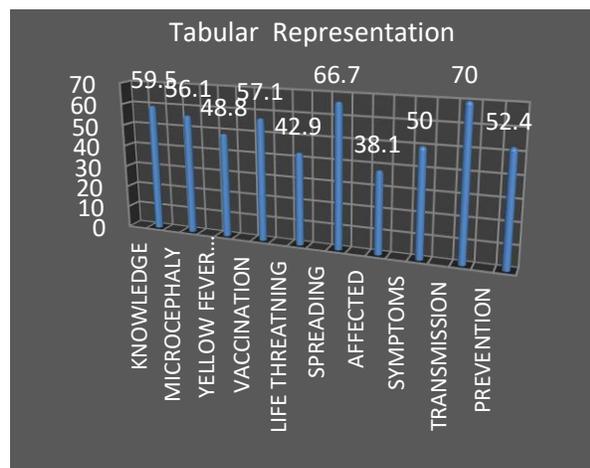
Understanding of students regarding ZV was evaluated in terms of basic awareness and knowledge. The statements which were answered with “yes” and obtained high percentages are further discussed, “Do you have knowledge about zika virus?” that is 59.5% followers, “Is microcephaly linked with zika virus?” that is 39% followers. Is zika virus relate to dengue virus or yellow fever?” that is 48.8% followers, “Is zika virus is a life threatening disease?” that is 42.9% followers and the least percentage was obtained from the question “Is the vaccine is available for this virus in Pakistan?” that is 21.4% only. While, the question which was answered with “No” and obtained the highest percentage was “In Pakistan Is the vaccine is available for this virus?” that is 35.7%, while the least percentage obtained from the statement “ Is zika virus relate to dengue virus or yellow fever?” that is 3%. Those students who said don’t know and obtained the highest percentage from the statement “In Pakistan is the vaccine available for this virus?” that is 57.1% while the least percentage obtained from the statement “Do you have knowledge about zika virus?” that is 0%. All the statements are clearly illustrated in table 2 (Part A).

Table 2 (Part A): Students Perceptions about Zika virus

Questions:	Yes (%)	No (%)	Don't know (%)
1) Do you have any knowledge about Zika virus?	59.5	40.5	0
2) Is microcephaly is linked with Zika virus?	39	17.1	56.1
3) Is Zika virus related to yellow fever and dengue?	48.8	3	48.8
4) Are there any vaccination/ treatment available for this disease?	21.4	35.7	57.1
5) Is this a life-threatening disease?	42.9	14.3	42.9

Table 2 (Part B): Responders' response to different Statements

Barriers of participants about CCHF	A (%)	B (%)	C (%)	D (%)
Do you know how it's spread?	14.3%	19%	66.7%	-
Who is most affected from this virus?	23.8%	-	38.1%	35.7%
How do you know if you have been infected? / Basic symptoms?	42.9%	8.1%	50%	-
How is it transmitted into body?	61.9%	33.3%	5%	-
How Zika virus can be prevented?	52.4%	16 (26.2)	9.5%	33.3

**Figure 1: High percentages obtained from the above statements.**

Evaluating the knowledge of candidates on zika virus from the basic statements, the marked percentages of the statements are high lightened. Responders for the statement “How zika virus spread?” responds highest percentage for “don't know” that is 66.7% while least percentage for the “tourist spots” that is 19%. Responders for the statement “who is most affected from this virus” responds highest percentage for the “pregnant women” while least percentage obtained for the “childrens” that is 23.8%. Responders for the statement, “what are the basic symptoms of zika virus” responds a high percentage for “don't know” that is 50% while least percentage obtained for nausea and vomiting that is 8.1%. Responders for the statement “how it is transmitted into the body?” responds a high percentage for the “mosquito” that is 1.9% while a least percentage obtained for rodents that is 5% (Figure 1). Responders for the statement “how zika virus is prevented” responds a high percentage for “mosquito repellent” that is 52.4% while least percentage obtained for “eating hygienic food” that is 9.5. As all the statements are illustrated in table 2 (Part B).

Discussion

Zika virus the most deadly and dangerous virus. It is a single stranded positive sense RNA Virus and belongs to the family Flaviviridae (Kuno et al., 2007). First time it was isolated in Zika forest of Uganda from a febrile rhesus macaque monkey in 1947. Later, it was identified in *Aedes africanus* mosquito in the Zika forest (Korhonen et al., 2015). Serosurveillance research studies in human supports that ZV is widespread across Asia, Oceania and Africa. However, it may have overestimated the true prevalence of virus due to the probable presence of serologic overlap between ZV and various flavivirus species such as West Nile Virus (WNV) and dengue virus (DENV) (Baba et al., 1999). The incubation time of mosquito is 10 days. It was suggested by a study that took place for the evaluation of kinetics of infectivity in mosquito *Aedes aegypti* via the use of blood feeding membrane. The viral count was higher on the starting day of inoculation (feeding) and through the 10th day it decreased to undetectable level then again enhanced by day 15 and continuously remained high through 20 to 60 days (Duffy et al., 2009). The period of incubation in humans from bite of mosquito to onset of symptoms is around 3 to 12 days. In 80% cases the infection was seen to be asymptomatic (Karimi and Razavi, 2017). From 4 days of age to 76 year of age all are susceptible.

Present study was conducted to rule out the understanding, knowledge and attitude towards the perception of ZV. It consists of 2 non-coding sides; 5' and 3', encoding the polyprotein that is further cleaved into the precursor of envelope, membrane, capsid, and 7 non-structural proteins (Kuno et al., 2007; Hayes, 2009).

Per the results of this study the accuracy of knowledge regarding ZV disease is very low. About 19% participants have knowledge that spreading of Zika virus is by tourist spots because mosquito attainment of virus may occur due to the blood meal. After uptake, the virus gets replicated and it is

transmitted to an animal (reservoir) (Karimi and Razavi, 2017). About 38.8% participants have knowledge that Zika virus mostly affected to pregnant women as Zika virus easily transmit from mother to fetus and causes microcephaly and birth defects which is known by only 39% participants. During survey, it has been noticed that 50% people have no knowledge for the common symptoms caused by Zika virus like fever, rash, myalgia, arthralgia, conjunctivitis and headache. Rash starts and spreads all over within 1 to 4 days of onset (Dupont-Rouzeyrol et al., 2015).

Typically, low grade fever occurs; 37.4°C to 38.0°C (Musso et al., 2015; Hamel et al., 2015). Symptoms are resolved mostly in 2 weeks. Chances of longer persistence are rare. Microcephaly (small heads) markedly increased with an increase in congenital CNS malformations. Death is rarely associated with Zika virus. However, it is noticed that participants were so confused around relation of Zika virus with yellow fever and dengue virus. Equal 48.8% votes have been recorded for the Zika linking with yellow and dengue as family of Zika includes several mosquito-borne -viruses' pathogen and clinical importance which mainly include dengue and yellow fever.

Human keratinocytes, immature dendritic cells and fibroblasts allow entry of ZV (Buckley et al., 1988). Various adhesion factors and entry factors like AXL receptor tyrosine kinase are needed for flaviviral replication and enhances the replication of Zika virus in skin fibroblasts. Previously, it was found that antigens of ZV were present exclusively in the nuclei of the infected cells. While, this study suggests that replication can also take place at other locations, that is a difference from other flavivirus species and this supports further investigation (Plourde et al., 2016).

35.7% participants have information of no availability of vaccines or treatment for Zika. However, supportive management includes only fluids, antipyretics, rest and analgesics. Vote for the life-threatening disease revolve around yes or don't know with an equal percentage of 42.9% as from all researches it found to be the life-threatening disease. 61.9% participants vote for transmission of Zika virus through mosquito by human host inoculation.

ZV enters the skin via cellular receptors and it can migrate towards lymph nodes and the blood stream. Per reports of possible transfusion-transmitted ZV, it also has concerns about the supply of blood in ZV endemic and non-endemic regions. The FDA of US has recommended a 28-day deferral for donors who have been suspected or confirmed for ZV (US Food and Drug Administration, 2016). Screening of donors by nucleic acid testing is being considered but it is probed to be difficult to implement due to regulatory considerations and high cost. Pathogen reduction technique has shown some efficacy (Aubry et al.,

2016). ZV must be considered a threat because it has now emerged outside Asia and Africa. ZV disease has remained mild and self-limited to date, but before the West Nile virus caused huge outbreak of neuroinvasive diseases in North America and Romania and it was first considered to be an innocuous pathogen. ZV discovery in a physically confined Yap Island is a demonstration of its capability to travel and escalate across large distances (Musso et al., 2014). ZV spread across Pacific may be challenging to detect due to the cross reactivity of flavivirus antibody assay. ZV illness can easily be confused with DNV and it may add up to illness during DNV outbreak. Recognition of spread and impact of ZV on human health requires collaboration of public health officials, clinicians and high quality reference laboratories. The control and prevention of ZV should include reduction of potential mosquito vectors and the use of insect repellents. Continued attention is needed, along with a united effort for improvement of knowledge, understanding, prevention and management of ZV.

Conclusion: The research and studies regarding Zika virus emphasize that it has become a genuine concern about health. This study states that only 60% of the general public is familiar with ZV. Understanding and knowledge towards ZV related illness and management is needed to be imparted to general population. It is largely spreaded mosquito produced viral disease which is transmitted primarily by *Aedes* mosquitoes. ZV disease leads to major damage in the nervous system. It has no treatment. The rate of mortality due to ZV infection has become very high in Pakistan. Environment also plays a critical role in rising Zika virus infection that affects both the livestock and general population. People should cover themselves completely and gloves should be used to handle the pets or livestock, especially when they are infected with ZV. Possible diagnostic tool should be made so that confusion between Zika virus and dengue could be differentiated properly. More and more awareness campaigns are needed to make people aware about a fatal viral disease.

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