

## Pakistani Healthcare Practitioners' Understanding of the Zika Virus Disease

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### Abstract

The current study aims to assess the knowledge of healthcare practitioners regarding Zika virus disease in Karachi, Pakistan. A cross sectional descriptive study was conducted from January 2016 to April 2016. The study population were physicians selected by non probability convenience sampling technique and were rendering their services in different hospitals and clinics of Karachi. Among the study participants, 41.4% considered themselves not very conversant about Zika virus. Medical literature (50%) and mass media (32%) were the major sources of health information. Approximately 75% did not know the availability of vaccine against Zika virus disease whereas 72.07% were not well versed with the availability and mode of treatment. Around 78% and 22% believed that mosquito bite and body fluid and secretions are the major source of infection respectively. It is concluded that our physicians are not well versed with the Zika virus disease. There is a need to advance the knowledge and understanding of Zika virus disease among physicians as they symbolize a well-informed component of society and healthcare structure. Furthermore, well-organized educational programs are necessary to expand appropriate awareness of public as regards Zika virus disease.

**Keywords:** Healthcare practitioner's knowledge; Pakistan Zika virus disease

### Introduction

The Zika virus (ZIKV), a vector borne virus is affecting a large number of people around the world and has become a major public health hazard [1]. The virus belongs to a family of flavivirus was first identified in Monkeys in year 1947 in Zika forest of Uganda [2,3]. From the 1950s to 1981 numerous studies conducted in the African countries such as Uganda, Egypt, Tanzania, Sierra Leon, Central African Republic and also different parts of Asia showed evidence of ZIKV in humans [4-8]. These results were not a cause for worry due to its low prevalence. Since then sporadic cases have been observed in different parts of the world without ringing alarm bells. Since the ZIKV's identification it has been isolated from different species of Aedes but researchers were not been able to establish any connection between these breed and animals infected with ZIKV. In 1956 for the first time Boorman and Porterfield were able to confirm the transmission of ZIKV from *Aedes aegypti* (Figure 1) to animal especially in mice and monkey [5,9,10]. First documented human ZIKV transmission case was by Simpson who

occupationally acquired Zika virus in 1964 [4]. Only one out of five infected patients develop symptoms of ZIKA disease [11].

Neither severe presentation, nor death had been reported before the current epidemic in French Polynesia. Since October 2013, French Polynesia has experienced the largest documented outbreak of ZIKV infection. From November 2013 to February 2014:42(3%) of 1,505 blood donors, although asymptomatic at the time of blood donation, were found positive for ZIKV by PCR [12]. Lorenzo Zammarchi reported the first two cases of laboratory confirmed ZIKV infections imported into Italy from French Polynesia. Both patients presented with low grade fever, malaise, conjunctivitis, myalgia, arthralgia, ankle oedema, and axillary and inguinal lymphadenopathy. One patient showed leukopenia with relative monocytosis and thrombocytopenia [13]. In October 2015 an outbreak of microcephaly cases were observed in the new born babies that led to the amniotic fluid analysis of pregnant women in the country [14]. The results from this test pointed towards the presence of ZIKV. According to a W.H.O. report on April 28, Brazil normally has an average of 163 cases of microcephaly each year, with only about 40 in the less populous northeast. Since October, officials have confirmed about 1,200, nearly 900 of them in the northeast and more than 13 countries have reported sporadic cases of ZIKV. Due to its rapid spread from Brazil in matter of months, it now requires a quick assessment and management of this communicable disease [15]. This virus has the probability to extend to vicinities where the Aedes mosquito vector is presented and could be a risk for our country. So



Figure 1: *Aedes aegypti*; Source of ZIKV disease.

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it is important for physicians to have sufficient knowledge so they can screen potential carriers in clinical settings and thus this study aims to assess the knowledge of healthcare practitioners on ZIKV in Karachi, Pakistan.

## Methods

A cross sectional descriptive study was conducted from January 2016 to April 2016. The study population were physicians selected by non probability convenience sampling technique and were rendering their services in different hospitals and clinics of Karachi. Physicians were surveyed with a 22 items questionnaire to assess their current knowledge regarding ZIKV disease. The questionnaire consisted of the demographic information of the physicians, items that explored their knowledge towards the recent outbreak, major source and route of transmission of infection, symptoms, diagnosis and potential complications of ZIKV disease. Prior to initiate the study consent was obtained from the concerned authorities in the hospitals and clinics. The purpose of research was explained to the physicians and their consent was obtained before the questionnaires were distributed. The questionnaires recovered were entered into Statistical Package for Social Sciences (SPSS 20.0, Chicago, IL) for study. The frequencies and percentages were used to analyze the demographic data of the participants. Descriptive statistics were employed to observe the response of physicians to survey items. The correlation of the independent characteristics with the responses of participants towards ZIKV disease was determined by means of a chi-square, at 0.05 level of significance.

## Results

In current study, two hundred survey forms were distributed through direct correspondence and left for a period of one week. On subsequent collection only one hundred and eleven forms were returned back. Hence the response rate was 55.5%. Majority of the physicians (64.86%) were male. Mass population (83.78%) of study was rendering their services in public sector hospitals (Table 1).

Medical literature (50%) and mass media (32%) were the major sources of health information. On inquiring about the knowledge towards ZIKV, 41.4% of physicians considered that ZIKV is a nationally notifiable condition however they did not considered themselves very up to date. Around 65% knew about the current status of ZIKV in the world, 80% stated that Africa was the place of recent outbreak. Male physicians were more likely to believe that mosquito bite and body fluid and secretions are the major source of transmission of ZIKV ( $p=0.034$ ). More than 70% deemed that ZIKV disease is vector-borne and the chiefly observed clinical features of ZIKV were fever (90.09%), myalgia (86.49%), retro-orbital pain (84.68%), headache (80.18%) and arthralgia (74.7%) (Figure 2). More than half (58.56%) did not know that ZIKV is fatal and only 5.41% assumed that symptoms of ZIKV are similar to those of dengue and chikungunya whereas 45% linked ZIKV with Guillain Barré syndrome (GBS). Majority (59.5%) of the male respondents ( $p<0.0001$ ) considered that the symptoms normally last for 1-10 days whereas 28.8% believed that the symptoms normally last for 7-15 days.

The responses of physicians regarding their knowledge of ZIKV are stated in Table 2. Approximately 75% did not know about the availability of vaccine against ZIKV whereas 72.07% were not well versed with the availability of treatment. Merely 39.63% and 45.95% knew the potential complications of ZIKV and how ZIKV is diagnosed respectively. Greater part (61.26%) did not know that ZIKV can be either sexually

Demographic Characteristics	Percentages (%)	p value
<b>Gender</b>		
Male	64.86	p=0.045
Female	35.13	
<b>Age (Years)</b>		
Less than 30	16.22	p<0.001
30-39	37.84	
40-49	25.23	
50 and above	20.72	
<b>Organization</b>		
Public Sector	83.78	p=0.429
Private	16.22	
<b>Field</b>		
Clinical	56.76	p=0.200
Academics	42.34	
<b>Position</b>		
Consultant/ Surgeon	9.91	p<0.0001
Head of department	7.21	
RMO	28.83	
Professor	15.32	
Lecturer	38.74	
<b>Experience (Years)</b>		
Less than 5	61.26	p<0.0001
5-10	17.12	
15-20	18.02	
20 and above	3.60	

Table 1: Characteristics of Study Population.

Statement	Yes (%)	No (%)	Don't know (%)
ZIKV is a nationally notifiable condition	41.44	30.63	27.93
ZIKV disease is fatal	19.82	21.62	58.56
Symptoms of ZIKV are similar to those of dengue and chikungunya	5.41	46.84	47.75
Know the potential complications of ZIKV?	39.63	22.52	36.03
Know that how ZIKV is diagnosed?	45.95	21.62	31.53
Is there any vaccine available against ZIKV?	24.32	0.90	74.77
Is there any treatment available against ZIKV disease?	2.70	25.23	72.07
Is there any link between ZIKV and Guillain Barré syndrome (GBS)?	45.05	29.73	24.32
Is ZIKV sexually transmitted?	18.92	19.82	61.26
Do you know that what can you recommend your patients to protect them from ZIKV?	47.75	18.02	33.33

Table 2: Physicians Knowledge of ZIKV Disease.

transmitted. Nearly half of the study population (47.75%) knew what to recommend the patients and general public to protect from ZIKV.

Around 40% opined that pregnant women are more likely to develop symptoms of ZIKV as compared to the general population (Table 3). More than half (52.25%) believed that ZIKV during pregnancy may be linked to microcephaly in newborns. Forty-four percent thought that women can transmit ZIKV to their fetuses during pregnancy or childbirth whereas 36.94% opined that mothers with ZIKV can breastfeed their baby.

## Discussion

New Caledonia reported imported cases of ZIKV from French Polynesia in 2013 and reported an outbreak in 2014 [16]. The profusion of mosquito vectors of flavivirus and accessibility of air travel in the Pacific region elevated concern for the stretch of ZIKV disease to other

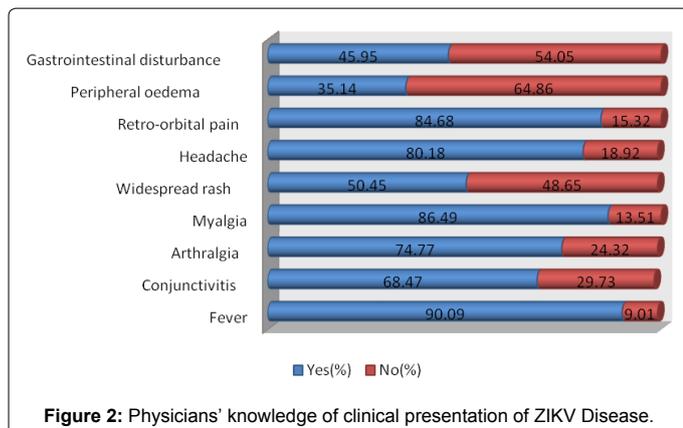


Figure 2: Physicians' knowledge of clinical presentation of ZIKV Disease.

Statement	Yes (%)	No (%)	Don't know (%)
Pregnant women are more likely to develop symptoms of ZIKV as compared to the general population	37.84	33.33	27.93
Can women transmit ZIKV to their fetuses during pregnancy or childbirth?	44.14	0.00	55.86
ZIKV during pregnancy may be linked to microcephaly in newborns?	52.25	28.83	16.22
Can mothers with ZIKV breastfeed their baby?	36.94	45.95	15.32

Table 3: Physicians Knowledge of Association among ZIKV Disease and Pregnancy.

islands in Oceania and yet to the America [15]. ZIKV is transmitted via mosquitoes, particularly *Aedes* species [17]. In current study, 41.4% physicians considered themselves not very conversant. Around 78% believed that mosquito bite is the major source of infection. Greater part (61.26%) did not know that ZIKV can be sexually transmitted or not. However, direct inter-human transmission, most probably by means of sexual intercourse, has been depicted [18].

The clinical symptoms become visible after few days of the infected mosquito bite and last around 3 to 12 days. Frequencies of asymptomatic presentations are common. However, ZIKV infection can cause wide range of symptoms similar to dengue like syndrome [19]. The symptoms range from mild fever, edema of extremities headaches, retro-orbital pain, conjunctival hyperemia and maculopapular rashes [20]. Our research report that fever (90.09%), myalgia (86.49%), retro-orbital pain (84.68%), headache (80.18%) and arthralgia (74.7%) were the chiefly observed clinical features of ZIKV observed by the physicians. Approximately 75% did not know that is there any vaccine available against ZIKV whereas 72.07% were not well versed with the availability of treatment. The typical clinical representation of ZIKV infection bear a resemblance to that of dengue fever and chikungunya apparent by headache, myalgia, arthralgia, fever, and maculopapular rash, a multifaceted symptom that hinders differential diagnosis [21]. Though the infection is self-limiting, cases of neurologic manifestations and the Guillain Barré syndrome were depicted in French Polynesia and in Brazil during ZIKV epidemics [14]. In this study, 45% linked ZIKV with Guillain Barré syndrome (GBS). There is no known effective drug or vaccine available drug to fight against ZIKV. Patients infected with ZIKV are generally advised to rest and drink lots of water [22]. Treatment, if required, is mainly supportive, including intravenous fluids and antipyretics. Anti-inflammatory drugs like Ibuprofen need to be avoided till dengue positivity is completely ruled out [17].

In current study 37.84% opined that pregnant women are more likely to develop symptoms of ZIKV as compared to the general population.

More than half (52.25%) believed that ZIKV during pregnancy may be linked to microcephaly in newborns. ZIKV was observed in amniotic fluid of two fetuses having microcephaly, revealing the intrauterine transmission of virus [14]. Patrícia reported a significant increase in cases of neonatal microcephaly amongst pregnant women that delivers in northeastern Brazil, and a consecutive increase was accounted in southeast Brazil in September 2015 [23]. ZIKV has been isolated from the amniotic fluid of pregnant women with infants having microcephaly and from the brain of a fetus with central nervous system (CNS) abnormalities [19]. In this study, 44% thought that women can transmit ZIKV to their fetuses during pregnancy or childbirth whereas 36.94% opined that mothers with ZIKV can breastfeed their baby. Besnard reported that the possible routes of perinatal transmission were trans placental, for the period of delivery, for the duration of breastfeeding and by close contact involving the mother and her baby [17]. He reported that sera from the mothers were RT-PCR positive in post-delivery two days and those of their baby within post-delivery four days suggestive of the fact that she was viraemic or at least incubating ZIKV at the moment of delivery [17].

The limitations of current research are the small sample size and constraint to the population of few institutions in Karachi. As with any retrospective study, our study faces the probable influence of problems with recall and social desirability response bias. Other limitations include lack of research and survey studies in the concerned field, so difficult to generalize the findings in Pakistan. Time duration and lack of funds directly reduces the survey sampling as well as further extension of this work.

## Conclusion

It is concluded that our physicians are not well versed with the ZIKV disease. There is a need to advance the knowledge and understanding of ZIKV disease among physicians as they symbolize a knowledgeable component of society and healthcare structure. Furthermore, well-organized educational programs are necessary to expand appropriate awareness of public as regards ZIKV disease.

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