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Attitudes towards Zika virus infection among medical doctors in Aceh province, Indonesia

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ABSTRACT

Zika virus (ZIKV) infection, a public health emergency of international concern, has recently been confirmed in Indonesia. However, to date, there has been no study to assess how prepared healthcare workers in Indonesia are to confront this emerging infectious disease. The aim of this study was to assess the attitudes of medical doctors in Indonesia towards ZIKV infection and its associated explanatory variables. A cross-sectional self-administered online survey was conducted from 3 May to 3 June 2016 in Aceh province, Indonesia. A pre-tested questionnaire was used to collect data on doctors' attitudes towards ZIKV infection and a range of explanatory variables (basic demographic data, professional characteristics, workplace characteristics and facilities, and medical experience related to ZIKV infection). Associations between attitude and explanatory variables were assessed using multiple-step logistic regression. We received 631 responses, 424 (67.19%) of which were included in the final analysis. Approximately 64% (271) of doctors had a poor attitude towards ZIKV infection. Experience considering ZIKV infection as a differential diagnosis and attendance at a national conference was associated with a good attitude, with odds ratios (OR) of 3.93 (95% confidence interval [CI]: 1.15–13.49) and 1.69 (95% CI: 1.03–2.76), respectively. Unexpectedly, doctors who had attended an international conference and those working at places that had molecular diagnostic (polymerase chain reaction based testing) facilities had lower odds of having a good attitude (OR: 0.35 [95% CI: 0.15–0.84] and 0.42 [95% CI: 0.19–0.95], respectively). In conclusion, the attitude towards ZIKV infection is relatively poor among doctors in Aceh. Therefore, strategies for enhancing their capacity to respond to ZIKV infection are needed. The survey concept and tools were well accepted by the participants of this study, suggesting that this rapid assessment could be rolled out across the Indonesian archipelago and elsewhere to identify and regionally differentiate unmet needs of disease and outbreak preparedness.

Introduction

On February 1, 2016, Zika virus (ZIKV) infection was declared a public health emergency of international concern by the World Health Organization (WHO). This designation was lifted on November 18, 2016 [1]. Zika virus infection was reported for the

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first time in humans in Nigeria in 1954 [2] and caused several outbreaks in Oceanian countries between 2007 and 2015 [3,4]. In May 2015, ZIKV infection was reported for the first time in the Americas (specifically, in Brazil) (although the virus seems to have been circulating there since 2013) [5–7], and currently, 59 countries and territories report continuing mosquito-borne transmission of ZIKV (cut-off date for updates: January 2017) [1]. Most of the ZIKV infection cases are asymptomatic. During a Zika outbreak in Yap Island, the symptomatic attack rate was only 18% of those infected (95% CI, 10–27) [3]. Acute ZIKV infection is usually mild with common symptoms including rash, fever, arthralgia, myalgia, fatigue, headache, and conjunctivitis. However, the infection can cause severe clinical complications and sequelae. ZIKV infection has been confirmed to be associated with microcephaly in neonates [8,9]. A study in Brazil reported a significant increase of microcephaly incidence during the Zika outbreak with more than 3800 cases of microcephaly (20 per 10,000 live births) [10]. In adults, ZIKV infection has been associated with severe neurological and non-neurological complications and sequelae including meningitis, meningoencephalitis, Guillain–Barré syndrome, loss of hearing, hypotension, and genito-urinary symptoms [4,11,12].

In Indonesia, the largest country of Southeast Asia and home to 254.9 million people, no Zika outbreak has been reported to date. However, Indonesia may be vulnerable for Zika outbreaks for at least two reasons: First, there is evidence indicating that ZIKV is already present in Indonesia. Serological studies found that serum samples from inhabitants in Central Java (1981) [13] and Lombok (1983) [14] contained a neutralizing antibody to ZIKV. In 2013 and 2014, two Australian travelers acquired confirmed ZIKV infection after visiting Indonesia [15,16], and in 2016, ZIKV was for the first time isolated from a patient in Indonesia (Jambi, Sumatra island) who had been suspected of suffering from dengue fever [17]. Second, the global risk of ZIKV infection depends critically on the suitability of *Aedes albopictus* mosquitoes as a vector of ZIKV in the field [18] and the potential for ZIKV to spread to all countries where *Aedes aegypti* and *A. albopictus* mosquitoes are established [19]. Co-circulation of ZIKV with dengue and chikungunya viruses most likely occurs throughout continents where the latter two are endemic [4]. In fact, Indonesia is one of the largest dengue endemic countries [20]; it has experienced several outbreaks of chikungunya fever [21–23] and is widely inhabited by both *A. aegypti* and *A. albopictus* mosquitoes.

As part of the rapid action plan on ZIKV infection as a public health emergency of international concern, WHO on March 24, 2016 released their guidelines and resource information pack for Knowledge, Attitudes and Practices (KAP) surveys on ZIKV infection [24]. Studies regarding the knowledge and attitudes of healthcare providers towards ZIKV infection are still rare. In Indonesia, our group recently published a report about knowledge on ZIKV infection among doctors in Aceh province, and we found that only 35.9% had good knowledge [25]. The aim of this study was to assess the attitude towards ZIKV infection and its associated explanatory variables among doctors in Aceh, Indonesia, to determine the appropriate target group(s) for a Zika prevention program.

Materials and methods

Survey design and data collection procedures

During 3 May to 3 June 2016, our group conducted the Aceh Zika Study. The study was a cross-sectional self-administered online survey to assess the knowledge and attitudes towards ZIKV infection among doctors in Aceh province, Indonesia. The target population was all medical doctors located in Aceh. To collect the data of interest, invitations to complete an anonymous online survey were sent by social media to the members of doctor organizations or groups. If no response was received, up to four reminders were sent after the initial message over a period of one month. An introduction explained the aims of the study and its expected benefits, emphasizing that participation was voluntary and anonymous, and answers were treated confidentially. The online survey was estimated to take approximately 10 min to complete. No financial compensation was offered. The data presented in this article were the attitudinal part of the Aceh Zika Study, while the report on knowledge of ZIKV infection has been published elsewhere [25].

Survey instrument

A questionnaire to collect data on doctors' attitudes towards ZIKV infection and a range of potential explanatory variables (basic demographic data, educational attainment, type of workplace, characteristics of the workplace and experience related to Zika disease) was developed. The questionnaire also covered knowledge of ZIKV infection [25]. To ensure the questions and pre-defined answers were sufficiently clear and relevant, the questionnaire was tested for its reliability among 30 participants during a pilot study. Data from the pilot study were not included in the final analysis.

Study variables

The response variable in this study was attitude towards ZIKV infection. To measure attitude, a questionnaire consisting of eight statements was used. Participants were asked to respond to the statements on a five-point Likert-like scale as follows: 1 = strongly disagree; 2 = disagree somewhat; 3 = neither agree nor disagree; 4 = agree somewhat; and 5 = strongly agree. Some questions were phrased in an opposite manner from the majority of the questions. A high score was given when agreement with the statement defined a positive attitude. The attitude score of each participant was computed as the total sum of responses so that higher scores indicated a better attitude.

The explanatory variables included basic demographic data (age, gender, educational attainment and type of occupation), and characteristics of the workplace included department, location (district, regency and province) and facilities. Questions on workplace facilities asked about the availability of specific testing procedures, such as polymerase chain reaction (PCR) and enzyme-linked immunosorbent assay (ELISA), and access to scientific journals. In addition, information on professional experience, including years practicing medicine, attendance at medical conferences/trainings in the last five months, and diagnosis of ZIKV infection in a clinical setting was collected from each participant. Knowledge of ZIKV infection was assessed using a set of 11 questions; details about this assessment have been published elsewhere [25].

Statistical analysis

The additive score for attitude towards ZIKV infection ranged from 8 to 40. For each participant, the level of attitude was dichotomized into "good" and "poor" based on a 75% cut-off point (using the highest score achieved). The associations between attitude towards ZIKV infection and explanatory variables were assessed using two-step logistic regression. All explanatory variables were included in univariate logistic regression, and all explanatory variables with $P \leq 0.25$ in univariate analysis were entered into multivariate analysis. The regression coefficients were expressed as an odds ratio (OR) with 95% confidence intervals (CI). The estimated crude OR of univariate and adjusted OR (aOR) of multivariate analysis were interpreted in relation to one of the categories, which was designated as the reference category (R).

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