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Epidemiology of Chikungunya Fever Outbreak in Tangerang District, Indonesia 2016

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Abstract
Introduction: *Chikungunya fever is a vector-borne disease caused by the Chikungunya virus, first discovered in Tanzania 1952. Chikungunya virus transmitted to humans through the bite of Aedes spp. Chikungunya fever provides symptoms of acute fever, muscle and joint pain. Since 1985 all provinces in Indonesia have reported an exceptional outbreak of Chikungunya fever. Tangerang district in 2014 reported chikungunya fever outbreak with total cases 67 people and in 2016 reported 15 cases of chikungunya fever.*
Aims: *(1) To described the Chikungunya fever outbreak in Tangerang district 2016 in terms of demographics distribution, (2) to evaluated clinical symptoms of the disease based on pre-existing conditions and (3) to identify the level of knowledge and behavior of the community regarding chikungunya fever.*
Material and Method: *We conducted a retrospective, cross sectional study of 15 clinically defined Chikungunya fever cases, and not confirmed by laboratory tests. Location of this study in Panongan sub district, at Tangerang district.*
Result: *About 60% cases were males and 40% cases were females, and 53.3% of the cases were in the age range of 20-54 years. Our results showed main symptoms were acute onset of fever with joint pain and rash (100%). In the affected area 66.6% people were aware of Chikungunya fever, and 60% knew the vectors which were responsible for the Chikungunya transmission, 53.3% had knowledge on insecticide spraying, only 13.3% had knowledge on the use of mosquito nets and repellents, 66.6% had knowledge on source reduction.*
Conclusion: *This study described that most cases of chikungunya fever were productive age and had a sufficient level of knowledge regarding chikungunya fever.*
Keywords: *Chikungunya fever, Outbreak, Symptom, Level of knowledge.*

Introduction

Chikungunya fever is a vector-borne disease caused by the Chikungunya virus, first discovered in Tanzania 1952[1]. The chikungunya virus transmitted to humans through the bite of the *Aedes spp*. Although *Aedes aegypti* is the main vector of the chikungunya virus, *Aedes albopictus* becomes very important in the presence of the chikungunya virus when *Aedes aegypti* is not found in temperate regions[2]. *Ae.albopictus* can live in urban and rural environments and breed in artificial water containers[3].

Ae.albopictus is widely found in the forests of Southeast Asia, because of its zoophilic life cycle. This species adapts to being anthropogenic which requires other food sources (domestic animals and human) and puddle for larval habitat. *Ae.albopictus* is active during the day and includes exophagics, preferring to feed in the morning and evening, although there are some exceptions depending on the season, place, availability of hosts and environment[4].

Chikungunya fever provides symptoms of acute fever, muscle and joint pain, and is often accompanied by a non-specific maculopapular rash[5]. All Chikungunya fever cases have symptoms of fever after an incubation period of 2-4 days, joint pain arises several days after fever and usually includes multiple symmetrical joints.

Maculopapular rash occurs 3 days after illness and ends in 3-7 days. Rashes are reported in 40-75% of Chikungunya fever cases starting from the limbs, accompanied by itching that spreads[6].

Since 1985 all provinces in Indonesia have reported the existence of Chikungunya fever outbreaks. Chikungunya fever outbreak was first reported in Samarinda 1973, 1980 in Kuala Tungkal, Jambi and Yogyakarta in 1983. Reports of the presence of Chikungunya fever outbreaks began to occur again in Muara Enim in 1999, Aceh in 2000 and West Java (Bogor, Bekasi, Depok) in 2001. Chikungunya fever spread again in Bekasi (West Java), Purworejo, and Klaten (Central Java) in 2002. The Chikungunya fever outbreak occurred in the East Kutai region (East Kalimantan) in 2010[7].

Tangerang District in Banten province of Indonesia reported the existence of Chikungunya fever outbreak with a total of 67 cases that occurred in 2014. In 2015 there were no reports of cases of Chikungunya fever in Tangerang District. Panongan subdistrict, in Tangerang District reported an increase of 15 Chikungunya fever cases in 2016[8].

With an increase of Chikungunya fever cases in Panongan sub-district, a study was conducted to (1) described the Chikungunya fever outbreak in Tangerang district 2016 in terms of demographics distribution, (2) evaluated clinical symptoms of the disease based on pre-existing conditions and (3) identified the level of knowledge and behavior of the community regarding chikungunya fever. The results of this research are expected to help the program in determining more effective control model to prevent an increase in the cases of chikungunya fever being repeated again in Tangerang district, Indonesia.

Material and Method

This research used a retrospective, cross sectional study in the case of suspected Chikungunya fever in Panongan sub-district, on September 2016 (figure 1). These cases were not confirmed by laboratory tests but according to clinical and epidemiological criteria for CHIKV fever.

Data is obtained by observing from house to house to identify the cases, socioeconomics, information relating to fever, onset of fever, symptoms of chikungunya fever, as well as the people knowledge and behavior. In accordance with clinical criteria, all cases of fever with joint pain are considered as cases of chikungunya fever unless proven not to be chikungunya.

Figure 1: Map of Banten Province, Indonesia

Results

This study conducted in Tangerang district with total sample 15 clinical cases of Chikungunya fever. The results showed that 60% of the cases were men and 40% of the cases were women. Most of the cases (53,3%) in the age group of 20-54 years, were of productive age (table 1).

The research found that the main symptoms of chikungunya were fever, joint pain and rash, felt by all cases (figure 2).

This study also looked at the community's knowledge of Chikungunya fever, its prevention and control in areas affected by Chikungunya fever. About 66.6% of cases knew about Chikungunya fever and 60% of them knew that Chikungunya fever is transmitted by mosquitoes to humans. The research also found that 53,3% respondents used insecticides spraying as preventeion of Chikungunya fever, 13.3% used mosquito nets and repellen, 33.4% used larvacide (figure 3). This study also illustrates 66.6% respondents knew how to control the source of transmission.

Table 1: Age and sex distribution of the Chikungunya fever

Age Group	Male	Female	Total Cases	%
5-9	0	1	1	6.7
10-14	2	0	2	13.3
15-19	3	0	3	20
20-54	4	4	8	53.3
55-64	0	0	0	0
65-69	0	0	0	0
≥ 70	0	1	1	6.7
Total Cases	**9**	**6**	**15**	**100**

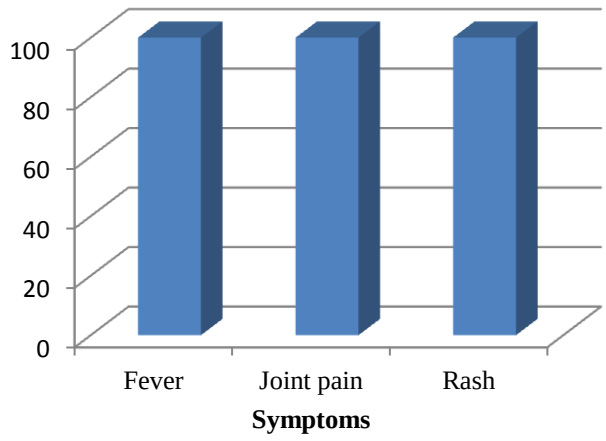

Figure 2: The symptoms of Chikungunya fever

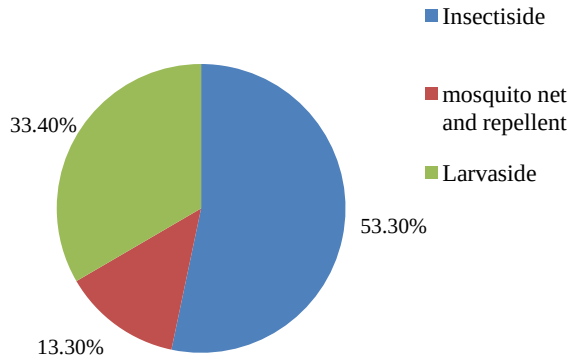

Figure 3: Prevention for Chikungunya fever

Discussion

The results of this study showed that the male group had a greater percentage than the group of women who were less exposed to Chikungunya fever, because most men work and have high mobility outside the house. Research conducted by Patil *et al.* (2013) in India showed that more men were infected with Chikungunya fever than female groups[9]. Masri & Subangkit (2014) showedthat in Indonesia there were more cases of Chikungunya fever in men with productive age[10]. The results of Sari's study (2015) in Karanganyar district showed that most people with Chikungunya fever cases were men, high school graduates and self-employed[11].

In this study, the highest number of Chikungunya fever cases was found in the age group of 20-54 years old, which is productive age. Research conducted by Ahmad (2009) in India showed that most cases were in productive age. Then it can be explained that the potential transmission is outside the house[12]. The biting activity of *Aedessp* usually starts in the morning and evening, with two peak activities between 9 - 10 AM and 4 – 5 PM, it is known that *Aedes aegypti* is very effective as a vector of this disease because of its habit of sucking blood repeatedly in one gonotropic cycle[13].

Habitat of *Aedes aegypti* in water reservoirs inside or outside the house. Chikungunya vectors in Indonesia that have been confirmed include the *Aedes aegypti* and *Aedes albopictus* mosquitoes. Both species are classified as domestic mosquitoes,

during the larvae, mosquitoes have breeding habitats in water reservoirs located in container with clear water[14].

In this study almost all cases showed classic clinical symptoms, fever and joint pain. This disease manifests after an incubation period of 2-4 days (between 3-12 days). Joint pain arised on the third and fourth day of fever, is an acute phase[15]. Fever occured very high (> 40° C) which is accompanied by shivering and stiffness. The fever period occurs 2 phases or like a horse saddle, the second phase is accompanied by relative decrease of the pulse. Fever lasts 3-4 days. The ankles, knees and wrists are the most common joints, but the small joints of the hands and feet are rarely affected, appearing between the second and fifth days of fever. A maculopapular rash accompanied by ptekie[16].

The results of this study indicate that most of the respondents knew about Chikungunya fever (66.6%) and 60% of them knew vector transmitters of Chikungunya fever. The research conducted by Patil *et al*. (2013) in India that most respondents knew about Chikungunya fever transmitted by vectors and kept the environment free of mosquitoes to prevent the occurrence of Chikungunya fever[9]. The level of knowledge generally cannot influence his behaviour[17].

Personal prevention by using repellents and mosquito nets. At the community level prevention, there are no water collection around the house. The general recommendation is that every five days places that can hold water must be emptied to decide the life cycle of mosquito[9].

In the literature, the factors that play role in the transmission of Chikungunya fever are humans, viruses and intermediate vectors. If the three factors are interconnected, causing the outbreak of Chikungunya fever. Other factors that can cause outbreak of Chikungunya fever are mobilitation of human populations from infected areas, poor environmental sanitation and increasing of mosquito density (availability of breeding sites and mosquito habitat)[18]. Poor sanitation includes water container as a breeding place for larvae to become adult mosquitoes, the Chikungunya vector. Especially if it is added to the condition of the house that is poorly maintained so that it becomes a place for adult mosquito to rest. The opportunity Chikungunya fever become an outbreak is getting bigger along with the increasing of mosquitoes density[17].

Conclusion

The Chikungunya fever outbreak in Tangerang district 2016 described that most of the cases were men from productive age who had symptoms of fever, joint pain and a rash. The Tangerang district community has sufficient knowledge regarding Chikungunya fever and transmission of the disease, although it has not affected community behavior to prevent transmission of Chikungunya fever.

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