Clinical Case Reports International

Short Communication
Published: 26 Aug, 2022

Dengue Vector Surveillance in South Dagon and Htantabin Townships, Yangon Region, Myanmar, During COVID-19 Transmission Period

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Abstract

Dengue is one of the major mosquito-transmitted diseases in Myanmar and the situation may become more critical in 2020 and onwards, with the emergence of the transmission of novel Coronavirus COVID-19. Consequently, vector control activities have been limited in dengue endemic areas. A cross-sectional descriptive study was conducted in South Dagon and Htantabin Townships in Yangon Region, Myanmar, to conduct dengue vector surveillance during COVID-19 transmission period, 2020. In South Dagon Township, 1,065 potential mosquito breeding containers were inspected and *Aedes* immature stages were found in 246 containers. Meanwhile, 309 *Aedes* infested containers out of 1,216 inspected containers were found in Htantabin Township. Discarded container type was the highest *Aedes* infested proportion in both townships and meanwhile, flower vase was the most common type container. Container Index (CI), Household Index (HI) and Breteau Index (BI) for South Dagon and Htantabin Townships were 23.1% and 25.4%, 65.6% and 71.4%, and 153.8 and 163.5, respectively. Absence of house-to-house dengue vector surveillance during pandemic situation, health staff were mainly assigned to COVID-19 prevention activities and limitation of manpower were likely the main reasons for the increase of dengue vector abundance. Thus, it is very important to encourage the community to acquire the voluntary involvement in conducting dengue vector control measures to prevent the future dengue outbreak in the COVID-19 pandemic period.

Keywords: Dengue; Vector surveillance; COVID-19

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Received Date: *05 Aug 2022*
Accepted Date: *22 Aug 2022*
Published Date: *26 Aug 2022*

Citation:
Kyaw AMM, Min Oo SZ, Maung W, Aye KM, Aung ZZ, Phyu PP, et al. Dengue Vector Surveillance in South Dagon and Htantabin Townships, Yangon Region, Myanmar, During COVID-19 Transmission Period. Clin Case Rep Int. 2022; 6: 1382.

Introduction

Dengue vector *Aedes* mosquito is also the main vector of Zika and Chikungunya diseases. *Aedes* control in Myanmar is primarily based on the utilization of chemical larvicides (temephos 1% sand granules) [1] which is mainly conducted by township health staff [2]. However, with the emergence of COVID-19, dengue vector control activity was gradually reduced. First COVID-19 case was reported in March 23rd, 2020 and since then majority of the health staff were assigned to response in COVID-19 prevention activities [3,4]. Moreover, people were strongly recommended to stay at home and partial lock down was applied in some areas of Yangon Region [5]. Consequently, vector control activities were limited in dengue endemic areas and thus led to the favorable situation for dengue vector abundance.

Rainy season occurs normally from June to September in Myanmar is regarded as dengue season with the reported highest incidence of dengue cases although dengue occurs throughout the whole year [2,6]. Therefore, it is important to conduct dengue vector surveillance activities during the rainy season to assess the dengue vector abundance under COVID-19 pandemic situation. Meanwhile, neighboring country, Singapore reported the dengue outbreak in 2020 with the recorded number of more than 14,000 cases [7]. Another study conducted in Peru also suggested the increase of dengue incidence in all endemic regions during COVID-19 pandemic period [8]. According to WHO, vector surveillance and control activities should be carried out continuously while observing the measures adopted by health authorities to control the pandemic of COVID-19 with the participation of community [9].

In the present study, the main objective was to perform dengue vector surveillance in dengue endemic areas, particularly South Dagon and Htantabin Townships in Yangon Region. This study

Table 1: Proportion of *Aedes* infested container types in South Dagon and Htantabin townships.

Container Type	South Dagon			Htantabin		
	No. of inspected container	No. of Aedes infested container	%	No. of inspected container	No. of Aedes infested container	%
Barrel	180	57	31.7	49	21	42.9
Bucket	75	33	44	39	13	33.3
Cement drum	180	60	33.3	117	15	12.8
Cement tank	9	3	33.3	35	7	20
Ceramic jar	87	30	34.5	188	39	20.7
Flower vase	438	9	2.1	612	99	16.2
Spiritual bowl	33	3	9.1	68	28	41.2
Discarded	63	51	81	108	87	80.6
Total	1065	246	23.1	1216	309	25.4

provided the crucial information for implementing of dengue vector control activities during COVID-19 transmission period in selected dengue endemic areas.

Materials and Methods

A cross-sectional descriptive study was conducted in South Dagon (16°51′0″N, 96°14′0″E) and Htantabin (17°8′0″N 95°55′0″E) townships from August 2020 to May 2021. South Dagon was one of the high dengue cases-reported townships in last 5 years (VBDC, Annual Report 2019). Meanwhile, Htantabin, a suburban area and located at outskirt of Yangon city, reported the highest dengue cases from January to June 2020. Thus, those two townships were selected purposively for the present study.

As precaution measures for COVID-19 transmission, the following measures were precisely performed during the activity: Applied minimum workforce (one entomologist, one epidemiologist, one Basic Health Staff (BHS) and one local ward authority), applied personal protective measures (masks and face-shields), routine temperature checking of survey team members and reduced the contact time with inhabitants.

Inspections of potential breeding habitats (presence or absence of *Aedes* mosquito immature stages) in and around household premises were inspected thoroughly by survey team following precaution measures as mentioned previously. Container type, size, place and type of water were noted down using checklist. Residents were requested to bring flower vases which were placed indoor to outside of the houses. In order to reduce communication time with residents, larvae and pupae were not counted and also water containers inside of the houses except flower vases were ignored in the present study.

Data analysis

Entomological data were analyzed by using R studio software and categorical data were shown in percentage. Following entomological indices were also applied to check the dengue vector abundance situation in the study areas.

1) Container Index (CI): No. of positive containers/No. of inspected containers × 100%

2) Household Index (HI): No. of positive houses/No. of inspected houses × 100%

3) Breteau Index (BI): No. of positive containers/No. of houses inspected × 100

Results

Total of 160 and 189 households were participated in South Dagon and Htantabin Townships, respectively. In South Dagon Township, total of 1,065 potential mosquito breeding containers were inspected and *Aedes* immature stages were found in 246 containers. Meanwhile, 309 *Aedes* infested containers out of 1,216 inspected containers were found in Htantabin Township. In terms of the number of containers, flower vase was the highest number of containers in both townships with 438 and 612, respectively, and followed by barrel and cement drums in South Dagon and ceramic jars in Htantabin Township. However, discarded container type was the highest *Aedes* infested proportion among all types of containers with the percentage of 81% in South Dagon and 80.6% in Htantabin Township (Table 1).

Container Index (CI), Household Index (HI) and Breteau Index (BI) were 23.1% and 25.4%, 65.6% and 71.4%, and 153.8 and 163.5, respectively, for South Dagon and Htantabin townships (Table 2).

Discussion

Among those 8 common types of containers (barrel, bucket, cement drum, cement tank, ceramic jar, flower vase, spiritual bowl and discarded), flower vase container type was the highest number in both townships as a part of the Myanmar culture. One study conducted in Yangon (2018) reported the very low proportion of *Aedes* infestation in flower vase container type [1]. However, two studies conducted in Yangon in 2010 and 2011 stated that flower vase was one of the key containers for mosquito breeding [6,10]. In the present study, proportion of *Aedes* infestation in flower vase was noticeably high in Htantabin Township which was the highest dengue case-reported township in 2020.

Discarded container type was the highest proportion of *Aedes* infestation in both townships and the same situation was reported in previous studies conducted in Hlaing Thar Yar [1] and South Dagon townships in Yangon. Majority of the health staff from townships were assigned to prevention and control of COVID-19 activities (MOH, 2020) which led to the gradual decrease of dengue vector surveillance and control activities. It might be one of the major reasons that the

Table 2: Entomological indices in South Dagon and Htantabin townships.

	South Dagon (160 households)	Htantabin (189 households)
Container Index (CI)	23.10%	25.40%
Household Index (HI)	65.60%	71.40%
Breteau Index (BI)	153.8	163.5

high *Aedes* infestation in inspected containers especially in discarded and flower vase containers. One study conducted in Bangladesh reported the increase of dengue cases and the decrease of the dengue vector control activities during COVID-19 pandemic situation [11]. Conducting house to house dengue vector surveillance during pandemic situation became the difficult task for health staff. Thus, it is very important to encourage the community to carry out voluntary vector control activities during the pandemic situation.

Acknowledgement

We give our thanks to the health staff of South Dagon and Htantabin Townships for their full participation in survey activities. We also would like to show our appreciation to the members of Medical Entomology Research Division, Department of Medical Research.

References

1. Oo SZM, Thaung S, Maung YNM, Aye KM, Aung ZZ, Thu HM, et al. Effectiveness of a novel long-lasting pyriproxyfen larvicide (SumiLarv® 2MR) against *Aedes* mosquitoes in schools in Yangon, Myanmar. Parasit Vectors. 2018;11:1-9.
2. National strategic plan for dengue prevention and control 2016-2020, vector borne diseases control programme, Ministry of Health and Sports. The Republic of the Union of Myanmar. 2016:1-39.
3. Win A. Rapid rise of COVID-19 second wave in Myanmar and implications for the Western Pacific region. QJM. 2020;113(12):856-7.
4. Boughton D, Goeb J, Lambrecht I, Headey D, Takeshima H, Mahrt K, et al. Impacts of COVID-19 on agricultural production and food systems in late transforming Southeast Asia: The case of Myanmar. Agric Syst. 2021;188:103026.
5. Ministry of Health. Stay at home. 2020.
6. Oo PM, Wai KT, Harries AD, Shewade HD, Oo T, Thi A, et al. The burden of dengue, source reduction measures, and serotype patterns in Myanmar, 2011 to 2015-R2. Trop Med Health. 2017;45:1-11.
7. Dengue cases. National Environment Agency. 2020:2-5.
8. Plasencia-Dueñas R, Failoc-Rojas VE, Rodriguez-Morales AJ. Impact of the COVID-19 pandemic on the incidence of dengue fever in Peru. J Med Virol. 2022;94:393-8.
9. Interim guidelines version I. Control of *Aedes* aegypti in the scenario of simultaneous transmission of COVID-19. World Health Organization. 2020:6.
10. Wai KT, Htun PT, Tin Oo, Myint H, Lin Z, Kroeger A, et al. Community-centred eco-bio-social approach to control dengue vectors: An intervention study from Myanmar. Pathog Glob Health. 2012;106(8):461-8.
11. Hasan MM, Sahito AM, Muzzamil M, Mohanan P, Islam Z, Billah MM, et al. Devastating dengue outbreak amidst COVID-19 pandemic in Bangladesh: An alarming situation. Trop Med Health. 2022;50(1):11.