ISSN 2089 - 2136

Tropical Medicine Journal

Volume 03, No. 2, 2013

TMJ	Volume 03	Number 02	Page 95 - 195	ISSN 2089 - 2136

Center for Tropical Medicine, Faculty of Medicine, Universitas Gadjah Mada
in collaboration with Indonesian Society of Tropical Medicine and Infectious Disease (PETRI)

Address : Tropical Medicine Journal, PAU Building, Jalan Teknika Utara Barek, Yogyakarta
Universitas Gadjah Mada, Yogyakarta 55281, Phone : +62-274-588483, E-mail: tropmedjournal@gmail.com

TROPICAL MEDICINE JOURNAL

ISSN : 2089-2136
Center for Tropical Medicine, Faculty of Medicine, Universitas Gadjah Mada in collaboration with Indonesian Society of Tropical Medicine and Infectious Disease (PETRI)

Volume 03, Number 02

CONTENTS

Knowledge, Attitude and Practice on Dengue Fever Transmission Among Urban and Periurban Residents of Dhaka City, Bangladesh

Muhammad Sohel Rana[1*] Mohammad Syaket Ahmed Shakil[2]
[1]Student of International Health, Post Graduate Program in Public Health, Universitas Gadjah Mada, Yogyakarta, Indonesia; [2]Student of Public health, North South University, Bangladesh.

Corresponding author: sohel.anthro176@gmail.com

ABSTRACT

Introduction: Dengue is one of the most important emerging viral diseases of major public health concern in Bangladesh.
Objectives: The purpose of this study is to assess the level of knowledge, attitude and practice on dengue fever transmission and prevention among the residents of Dhaka city, Bangladesh.
Methods: A cross-sectional study was done among three hundred and forty three randomly selected residents of urban and periurban regions of Dhaka city in November in 2012 using a pretested and self administered questionnaire. Data was analyzed by a Chi square test and p value less than 0.05 is considered as significant.
Results: The study found that among the respondents 63.3% were female, 48% were married and 37.7% were of age group of 21-30 (mean=31.34, SD=11.758). Majority of the respondents had secondary/higher secondary (50.9%) and students represented 34.1% of the total respondents. It was found most of them had no history of having affected from dengue fever (97.7%) and 53.2% did not travel to the subtropical or tropical region. Television (61.2%) and radio (50.4) were most common source of information of dengue fever. Majority of the respondents had low level of knowledge on dengue (89.1%). It was found that 81% knew that mosquitoes generally lay their eggs on dirty water, 79.6% knew mosquitoes spread dengue from one person to another and 70.6% were aware that dengue can fever is flu like illness that affects infants, young, children and adults. The study revealed 50.1% had neutral attitude towards dengue fever, and there was significant association between age and practice ($p=0.031$); knowledge and practice ($p<0.000$) and also attitude and practice ($p<0.000$).
Conclusion: There is a different level of knowledge regarding dengue fever among respondents in the study area. Public awareness is necessary to address the knowledge gap revealed by this study. Hence it is necessary to organize the public education program to prevent the people from the outbreak of dengue by increasing level of Knowledge so that they can attain positive attitude and adopt desired behavioral changes.

Keywords: Knowledge, Attitude, Practice, Dengue Fever, Dengue Hemorrhagic Fever, Dengue Shock Syndrome.

INTISARI

Pendahuluan: Dengue merupakan salah satu penyakit viral yang paling penting dan masalah kesehatan masyarakat utama di Bangladesh.

Tujuan: Penelitian ini bertujuan untuk menilai tingkat pengetahuan, sikap dan perilaku penduduk Kot Dhaka, Bangladesh tentang pencegahan dan penularan demam dengue.

Metode: Penelitian ini merupakan penelitian potomg lintang melibatkan 343 penduduk yang dipilih secara acak di daerah urban dan peri-urban Kota Dhaka pada bulan November 2012 dengan menggunakan kuesioner *pretested* dan *self-administered*. Data dianalisis dengan uji *Chi square* dan dinyatakan signifikan apabila p<0,05.

Hasil: Subyek penelitian ini sebanyak 63,3% wanita, 48% menikah dan 37,7% merupakan kelompok usia 21-30 tahun (rerata=31,34, SD=11,758). Kebanyakan subyek (50,9%) merupakan pelajar lulusan sekolah menengah (SMP/SMA) dan merupakan 34,1% dari keseluruhan subyek. Sebagian besar subyek (97,7%) belum pernah menderita demam dengue dan 53,2% belum pernah pergi ke daerah tropis atau subtropis. Sumber informasi mengenai demam dengue didapatkan dari TV (61,2%) dan radio (50,4). Pengetahuan subyek tentang demam dengue umumnya rendah (89,1). Sebanyak 81% subyek mengetahui bahwa nyamuk meletakkan telurnya di air kotor, 79,6% mengetahui kalau nyamuk dapat menularkan dengue dari satu orang ke orang yang lain dan 70,6% menyadari kalau gejala dengue yang bersifat *flu like illness* dapat menyerang bayi, anak dan dewasa. Sebanyak 50,1% subyek memiliki pengetahuan yang cukup mengenai demam dengue dan terdapat hubungan yang bermakna antara usia dan perilaku (p=0,031); pengetahuan dan perilaku (p<0,000) dan sikap dan perilaku (p<0,000).

Simpulan: Terdapat perbedaan pengetahuan mengenai dengue pada masyarakat di wilayah penelitian. Kesiapan masyarakat tentang dengue sangat penting untuk mengatasi perbedaan ini. Program pendidikan masyarakat penting untuk dilaksanakan secara terorganisir untuk mencegah wabah demam dengue dengan meningkatkan tingkat pengetahuan masyarakat sehingga dapat meningkatkan sikap positif dan mengadopsi perubahan sikap seperti yang diharapkan.

Kata Kunci: Pengetahuan, Sikap, Perilaku, Demam Dengue, Demam Berdarah Dengue

INTRODUCTION

Dengue is one of the most important emerging viral diseases of major public health concern in Bangladesh. Dengue was first reported as "Dacca fever" in Bangladesh in 1964 by Aziz and his colleagues[1]. Subsequent reports suggested that dengue fever may have been occurring sporadically in Bangladesh from 1964 to 1999[2,3,4,5,6,7]. The first epidemic of dengue was reported in the capital city, Dhaka in the year 2000[8]. Since then the disease has shown an annual occurrence in all major cities of the country. During January 2000–December 2007, Bangladesh recorded a total of 22 245 cases and 233 deaths (1.04%). Of these, Dhaka accounted for 20115 cases and 181 deaths (0.9%).Number of reported cases of dengue in Bangladesh in past few years is 1153 (in the year 2008), 474 (in the year 2009), 76 (in the year 2010). And Incidence of reported dengue cases is 0.72 (in the year 2008), 0.29 in the year 2009), 0.05(in the year 2010)[9].

In theory, distribution occurs biannually which are at the beginning of the rainy season,

from early May to July, when water containers and various discarded containers are wet and productive for mosquito breeding and the maturation of larvae and from early August to October. If we look at the dengue situation of Dhaka City in year 2012 month by month we can see an overview of dengue cases; January to May there is no dengue cases but from June there is reported dengue cases. In June there are 10 reported dengue cases, in July 129, in August 122, in September 256, in October 107, in November 27.

In 1996-97 dengue infections were confirmed in 13.7% of 255 fever patients screened at Dhaka Medical College. And the first epidemic of dengue haemorrhagic fever occurred in mid 2000, when 5551 dengue infections were reported from Dhaka and Khulna cities, occurring mainly among adults. Among the reported cases 4385 (62.4%) were dengue fever infections and 1186 (37.6%) cases were dengue haemorrhagic fever. The case fatality rate (CFR) was 1.7% with 93 deaths reported. *Aedes aegypti* was identified as the main vector responsible for the epidemic and *Aedes albopictus* was identified as a potential vector in Dhaka. The worst outbreak was in 2002 with 6,104 cases and 58 deaths[10].

In 2005 there were 1048 reported cases and 4 deaths (CFR 0.38%). The number of cases and deaths reduction was about 73% and 69% as compared to 2004. In 2006 the number of cases and deaths increased by 2 fold as compared to 2005. The maximum transmission period is July to September each year since 2000.

There were several studies regarding dengue disease in Bangladesh. Most of the study was concerning about the transmission and outbreak about dengue disease. Some were about health seeking behavior in rural Bangladesh. Conducted a knowledge, attitude and behaviour (KAB) survey among residents of Dhaka regarding dengue (DF) and dengue haemorrhagic fever (DHF) from August to October, 2000, during the first recognized outbreak of DF/DHF in Bangladesh[5]. A random sample of more than 9,000 houses was visited by survey teams throughout the city. More than 99% of people living in the city had heard about dengue and 95% knew that the disease was transmitted by mosquito bites, 93.5% knew that the dengue-transmitting mosquito bit during daytime and 52.1% knew that this mosquito bred in containers. Nearly 60% of slum-dwellers could not spend any money to buy commercially-available aerosols/coils for their houses, while the rest 40% could spend very little money for this purpose. About 10% of people living in independent houses and multistoried buildings spent more than US$ 10 for mosquito control gadgets per month (equivalent to a week's salary for most workers in Bangladesh). In the slum areas and in semi-permanent (semi-pucca) houses, earthen jars and drums, common sources of *Aedes aegypti* breeding, were frequently used for storing water. In more upscale, independent houses where mosquito density was higher, rooftop concrete water tanks were more common. Two-thirds of city-dwellers thought that both government and citizens should be responsible for mosquito control.

The purpose of this study is to assess the level of Knowledge, Attitude and Practice on dengue fever transmission and prevention among the residents of Dhaka city, Bangladesh.

MATERIALS AND METHODS

A systematic simple random sampling technique was applied for the sample of respondents. For this the following steps were followed. Sample size was selected randomly from any five different random places of Dhaka City at landscape level representing the different ecotopes and ecological region (slum, dense settlement, industrial area, settlement near vegetation, residential area with grounds and gardens). The random selection of wards was done in each cluster for household selection. The respondents were chosen from every fifth house from the starting alternating the side of the transverse line.

Sample size

The study Sample size was taken on the basis of following formula,

Sample size (n) = $\frac{Z_a^2 pq}{d^2}$

Where,

n = the minimum sample size

z = the standard normal deviate usually set at 1.96 which corresponds to the 95% CI

p = proportion of the target population = 68%

q = 1 – p

d = desired degree of accuracy considered = 0.05

By using formula,

sample size (n) = $\frac{(1.96)^2 \times 0.68 \times 0.32}{(0.05)^2} = 334.3$

Based on this formula, the sample size for this study was 335 subjects

Variables

Explanatory sociodemographic factors included age, gender, education, marital status, religion, family income and occupation. Knowledge on eco-bio-social determinants of dengue and its vector included knowledge in *Aedes* mosquito and its ecology and knowledge in dengue fever. Attitude towards disease and vector control included feelings and beliefs towards dengue, behavior, feelings and beliefs towards *Aedes.* IEC related factors included sources of information (Radio/TV, newspaper, health worker, posters, hospital, internet, training, education, health training, relative/friends, consultation etc.)

Data Collection Tools

Semi structured questionnaire was used as the data collection tool. The respondents were interviewed and the practice level were observed and recorded in the observational checklist by the researcher. Most of the questions were close ended, semi structured, and few were mixed and open-ended questions. The questions were in English and Bengali as well.

Data management and analysis plan

Answered questionnaire was checked individually, edited and coded after collection. Compilation and subsequent tabulation was done. The respondent with inconsistencies has been discarded. Simple technique of data analysis such as frequency distributions and other descriptive statistics was used. Tabular and graphical presentation and charts will be used. Data was analyzed by a Chi square test and p value less than 0.05 is considered as significant.

Quality control and quality assurance

A draft questionnaire was developed according to the objectives of the study. The questionnaire was tested through pilot study. Before finalization of the questionnaire, necessary modification and correction was done.

Ethical consideration

Following the WHO and Bangladesh Medical Research Council (BMRC) guidelines of ethical consideration, the informed consent was taken before the interview. Respondent's right to refuse and withdraw from study any time was accepted. Confidentiality of the respondents was maintained.

RESULTS AND DISCUSSIONS

This study was conducted in ward number 41, Patharghata Area, Dhaka. There were a total of three hundred and forty three (343) respondents. The study was conducted in six block/moholla of ward number 41 of Patharghata Area. The findings of the study are based on the questionnaires filled by the respondents, and observation checklist filled by the surveyors. Distribution of the respondents by sociodemographic characteristics is represented in Table 1.

Table1. Distribution of the respondents by sociodemographic characteristics

Characteristics	Number (n=343)	Percentage (%)
Age group (Years)		
<21	70	21.3
21-30	124	37.7
31-40	66	20.1
41-50	35	10.6
>50	34	10.3
Mean = 31.43 SD = 11.758	Minimum = 16	Maximum=60
Marital Status		
Unmarried	157	47.1
Married	160	48
Widowed/ Divorced	16	4.8
Education Level		
Illiterate	11	3.3
Literate	35	10.5
Primary	24	7.2
Secondary/higher secondary	170	50.9
Graduate and above	94	28.1
Income (Rupees/Month)		
≤5000	148	43.1
5001 -10000	73	21.3
10001 -25000	58	16.9
25001 -50000	25	7.3
≥50000	39	11.4
Travel to Sub Tropical /Tropical region		
Yes	160	46.6
No	182	53.2

The mean age of participants was 31.43 with standard deviation of 11.758. The range of age is from 16 to 60 years. Table 1 shows that the majority of the respondents (37.7%) were in the group of 21-30 years, 21.3% were younger than 21 years, and 41% were older than 30 years. Most of them (i.e. 48%) were married followed by Unmarried which was 47.1%. Most of them were educated to secondary/higher secondary level (50.9%) and in graduates and above (28.1%). Most of respondents had income of less than 5000 rupee per month (43.1%). Among the respondents 61.2% had received some form of information regarding dengue fever while rest had not received any as shown in Figure 1. During the survey more than one source for received information about dengue fever were recorded. Among them 61.2% received from TV and then radio (50.4%) followed by newspaper.

Participants answered 10 multiple choice questions about dengue fever. Each correct response was given 1 mark with a total of 17 marks. The mean knowledge score for the respondents was 5.27 out of possible 17 points (standard deviation=2.158). None of the respondents were able to answer all the questions correctly. The range of the knowledge score was 0-17 as shown in Table 2.

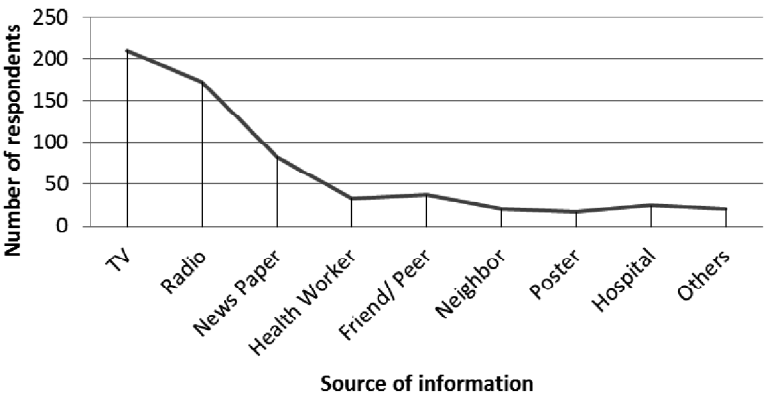

Figure 1. Distribution of respondents by source of information of dengue (n=343).

Table 2. Distribution of respondents on the basis of their level of Knowledge on dengue fever

Level	Number (n=343)	Percentage
High (17-13 scores)	0	0
Moderate (12-9 scores)	35	10.1
Low (8-0 scores)	286	89.1
Total	321	100
Mean=5.27; SD=2.158	Minimum=0	Maximum=9

Respondents answered a total of 11 questions which had a total score of 55. There were 7.6% of the respondents who had "positive attitude", 50.1% had "neutral attitude" while 42.3% had "negative attitude". The mean of attitude for all the respondents were 44.15 out of 55 points (SD=4.891). The range of the attitude score was 33 and 55 respectively as shown in Table 3.

Table 3. Distribution of respondents by Attitude level

Level	Number (n=343)	Percentage
Positive (55-46 scores)	26	7.6
Neutral (45-36 scores)	172	50.1
Negative (35-11 scores)	145	42.3
Total	343	100
Mean=44.15; SD=4.891	Minimum=33	Maximum=55

Table 4 shows a summarized response for the practice part of the questionnaire. Most of the respondents examine discarded things that can hold water around their house (82.6%). The questions which were least answered were 3.2% and 9.9% for the question regarding the method to reduce the nuisance of mosquitoes (items 1.4 and 1.2).

A total of 122 observation check list were filled out of 343 survey forms. These represented all the selected households of Patharghata representing respondents of this research. Among the respondents, 91% were considered as “clean”. Among 122 house hold 15.6% had water accumulated under flower pot and 14.8% had water accumulated in toilet, 24.6% had unwanted object that held water, 12.1% had bottles that could hold unwanted water. Among the respondents, 78.7% covered the stored water and most of the respondents (73.1%) did not have any water of rainwater accumulated around their houses.

As shown in Table 5, there is no association between travel history to the tropical region and the level of practice.

Table 4. Distribution of respondents on the basis of each item on the practices

Items	Number	Percentage
1.1 Indoor spraying to reduce the nuisance of mosquitoes.	100	29.2
1.2. Covering the water containers to reduce the nuisance of mosquitoes.	34	9.9
1.3. Cleaning rubbish to reduce the nuisance of mosquitoes.	126	36.7
1.4. Putting chemicals in water to reduce the nuisance of mosquitoes	11	3.2
1.5. Using electronic gazettes to reduce the nuisance of mosquitoes.	35	10.2
1.6. Bed net to reduce the nuisance of mosquitoes.	238	69.4
1.7. Nothing to reduce the nuisance of mosquitoes.	1	0.3
1.8. Others to reduce the nuisance of mosquitoes.	0	0.0
2. Do you often examine the mosquito larvae in the flower pots how even?	86	25.1
3. Do you change the water of the indoor plant every week.	225	67.0
4. Do you often drain off water in plates of flower pots?	229	71.3
5. Do you examine any discarded thing that can hold water around your house?	288	86.2

Table 4. Distribution of respondents on the basis of each item on the practices (continued)

Items	Number	Percentage
6. Do you use mosquito coil?	273	81.0
7. Do you participate in any campaign of dengue infection in any community?	60	18.0
8. Do you participate when your community has sprayed fog	112	33.6
9. Do you ever examine the mosquito breeding water container in toilet?	158	47.0
10. Do you check and clean your roof gutted in roof?	180	52.5

Table 5. Association between level of practice and travel history to tropical/subtropical region

Level	Travel History					
	Yes		No		Total	
	n	%	n	%	n	%
Poor Practice	109	75.69	125	78.62	234	77.23
Fair Practice	34	23.61	34	21.38	68	22.44
High Practice	1	0.69	0	0	1	0.33
Total	144	100	159	100	303	100
$\chi^2 = 1.355$	df=2		p=0.465			

The results of this study showed that the demographic data was not correlated with level of practice scores except for age. This study found that age had significant association with level of practice behavior of dengue fever prevention among the respondents. The respondents of age group 51-60 year old had better practice of dengue prevention than other group. This might be because elder population is the head of family and they care if everything is in order and care for the proper cleanliness and maintenance of the house environment. Level of education had no association with the practice of dengue prevention. This does not mean that education was not an important factor which fell short to apply education to practice. One of the possible reasons might be that educated people have other jobs and responsibilities and have less or no time to practice prevention of dengue fever. People are well informed and well equipped with what to do and how to handle the situation but they are careless to put them into practice.

There was no significant association between travel to the tropical or subtropical regions and exposure to dengue (p=0.465). This indicated that dengue history and travel to the tropical and sub tropical regions were not important confounders in this analysis. The mean score was 5.27 point with a standard

deviation of 2.158. Most of the respondents who participated in this study (89.1%) had very low level of knowledge despite the fact that 61.2% had received the information regarding the dengue fever. This might be because dengue is emerging disease which has been detected recently and the study area has very less incidence rate. The people hear about the dengue in the form of dengue incidence from the mass media like TV, internet, radio etc., in the form of news like they heard about an Indian celebrity and they don't think it is challenge to their health in their places. It is also that people have insufficient knowledge about the understanding of the disease. There were no respondent with high level of know-ledge because the disease is very new in this place and has very low incidence in this region. There has not been any awareness program focusing the region.

The area where respondents scored well was on the question on how dengue spreads from one person to another person. The responses showed that 79.6% were aware that mosquitoes transmit dengue. The highest average percentage scored by the respondents was the question where the mosquitoes lay eggs. Among the respondents 81% responded understand that mosquitoes lay their eggs on the dirty water.

Another area in which the respondents had better knowledge was regarding the nature of dengue fever and the affected population. Most of the respondents were aware that dengue fever is flulike illness that affect infants, young, children and adults (70.6%). Most of respondents were unaware about when dengue mosquito bites. Of all the respondents, only 7.3% only knew that mosquitoes transmitting dengue bite in the day time. Another important area the respondents incorrectly answered or did not know about its treatment and drug of choice. Among the respondents, 93.9% did not know that there is no specific treatment for dengue. This shows that they are unaware of drug and this also implies that they can take random drugs especially aspirin and acetaminophen when they get flu and body/headache which is very critical for dengue patients.

The mean survey score for the attitude was 44.15 from a possible 55 scores with the standard deviation of 4.891. In this study more than half of the respondent (50.2%) had neutral attitude while most of others (42.3%) had negative attitude towards dengue fever transmission. The probable reason for this might be that most of the respondents were students and job holders who keep busy and don't take active part or bother to do so in disease control and home environment related to health.

This study revealed a significant association between attitude and practice of dengue fever prevention. In this study more than half of the respondent disagreed that government should penalize household with mosquitoes breeding sites. Most of the respondents had not clearly positive attitude on role of neighborhood to prevent dengue disease. This may be due to the individualistic lifestyle of Patharghata where the people don't bother to speak on behalf of their community. A total of 122 houses were representing all the areas of data collection of which 91% had their home environment clean. The residents of Patharghata have less area around their place of living due to high density, as a result, even they keep their area of authority clean the property next to them are not maintained well.

This study found that 84.4% of respondents did not have water under flower pot because they wipe off or sweep away water under the flower pot. Among the respondents 85.2% did not have unwanted water collected in the toilet. However, most of the house had usable water accumulated for flushing and or washing purpose. Among respondents, 24.6% house had unwanted things that held water, the places which had unwanted objects holding water was due to lack of availability of regular municipal waste management services. The study found 87.7% did not have bottles with dirty water; this was because most of the respondent used to sell the used bottles. It was found that 78.7% household had their stored water covered and 73.8% of the respondent had no rainwater or other form of water collected, this is because the data were collected post monsoon period and most of the locations had dearth of water.

CONCLUSION

There is a different level of knowledge regarding dengue fever among respondents in the study area. Public awareness is necessary to address the knowledge gap revealed by this study. Hence it is necessary to organize the public education program to prevent the people from the outbreak of dengue by increasing level of Knowledge so that they can attain positive attitude and adopt desired behavioral changes.

REFERENCES

1. Islam MN, Khan AQ, Khan AN. Viral disease in Bangladesh: Procedings of an international seminar on viral disease in South East Asian and Western Pasific. Washington DC, Academic Press, 1982.
2. Khan AM, Ahamed TU. Dengue status in Bangladesh. Dengue News, 1986; 12-11.
3. Amin MMM, Hussain AMZ, Murshed M, Chowdury IA, Banu D. Sero-diagnosis of dengue infections by haemagglutination inhibition (HI) in suspected cases in Dhaka, Bangladesh. Dengue Bull, 1999;23:34-8.
4. Alam MN. Dengue and dengue haemorrhagic fever in Bangladesh. Orion Med J, 2000;6:7-10.
5. Hossain MA, Khatun M, Arjumand F, Nisaluk A, Breiman RF. Serologic evidence of dengue infection before onset of epidemic, Bangladesh. Emerg Infect Dis, 2003 Nov;9:1411-14.
6. Aziz MM, Hasan KH, Hasanat MA, Siddiqui MA, Salimullah M, Chowdhury AK, Ahmed M, Alam MN, Hassan MS. Predominance of the DEN-3 genotype during the recent dengue outbreak in Bangladesh. Southeast Asian J Trop Med Public Health, 2002;33:42-8.
7. Bowie C, Prothero D. Finding causes of seasonal diseases using time series analysis. Int J Epidemiol, 1981;10:7-92.
8. PSTC, Half yearly progress report, 15 March to 14 August, 2012.
9. Cambodia DSP. National Health Statistics Report 2002.Department of Planning and Health Information, Ministry of Health, Phnom Penh, 2004a.
10. WHO: Dengue/dengue haemorrhagic fever. Available from: URL: http://www.who.int/csr/disease/dengue/en/
11. da Foncesa BA, and Foncesa SN. Dengue Virus Infections. PubMed. February, 2002;14(1):67-71. Avaliable from: URL: http://www.ncbi. nlm.nih.gov/pubmed/11880737
12. Debarati Guha-Sapir, and Barbara Schimmer. Dengue fever: new paradigms for a changing

epidemiology. Emerging Themes in Epidemiology, 2005;2(1). doi:10.1186/1742-7622-2-1 Avaliable from: URL: http://www.ete-online. com/content/2/1/1,

13. Summary of the dengue situation in the Western Pacific region, Manilla, World Health Organization Western Pacific Regional Office; 2001:9.
14. Strengthening implementation of the global strategy for dengue fever/dengue haemorrhagic fever prevention and control, report on the informal consultation. Geneva, WHO; 1999.
15. WHO: Dengue/dengue haemorrhagic fever. Weekly Epidemiol Rec 2000, 75:193-6.
16. Gubler DJ. Dengue haemorrhagic fever: a global update [Editorial]. In: Virus Information Exchange Newsletter. Nedlands, Western Australia: University of Western Australia, 500-512. Hyg 1988;38:411-419.1993;75:65-75.295-297.1028-1029, 1991;8:2-3.
17. Qiu F-X, Gubler DJ. Liu J-C, Chen Q-Q. Dengue in Chinaa clinical review. Bull World Health Organ, 1993;71:349-359,11.
18. Halstead SB. The 20th century dengue pandemic: need for surveillance and research. World Health Stat Q, 1992;45:292-8.
19. World Health Organization (WHO). Dengue fever/dengue haemorrhagic fever surveillance [Singapore], 1991. Wkly Epidemiol Rec, 1992; 67:296-7
20. Cambodia DSP. National Health Statistics Report 2002.Department of Planning and Health Information, Ministry of Health, Phnom Penh, 2004a.
21. Cambodia DSP. National Health Statistics Report 2003. Department of Planning and Health Information, Ministry of Health, Phnom Penh, 2004b.
22. Cambodia DSP. National Health Statistics 2004. Department of Planning and Health Information, Ministry of Health, Phnom Penh, 2005.
23. Chantha N. Dengue situation in the Kingdom of Cambodia. In: Proceedings of the Regional Workshop on Abate Application in 2003, Phnom Penh, 2003.
24. Aziz MA, Graham RR, Gregg MB. “Dacca fever” an outbreak of dengue. Pak J Med Res, 1967;6:83-92.
25. Gaidamovich SY, Siddiqi SM, Haq F, Klisenko GA, Melnikova EE, Obukhova VR. Serological evidence of dengue fever in the Bangladesh Republic. Acta Virol, 1980;24:153.

Tropical Medicine Journal

PAU Building
Jl. Teknika Utara, Barek, Yogyakarta 55281
0274-588483, email: tropmedjournal@gmail.com
Published by Faculty of Medicine, Universitas Gadjah Mada

Instructions to the Authors

Tropical Medicine Journal is a journal devoted to the publication of original articles in all field of basic, tropical medicine and tropical medical biotechnology.

This journal is a journal in tropical medical sciences that used as the media forndissemination of original research, innovative, ideas and new hypotheses in biomedicine, both for medical development, education and application. It also welcomes perspectives articles, biomedical history abriged articles, and reviews.

Statements and opinions expressed in the articles herein are those of author(s) responsibility and not necessary those of the Editor(s), the Faculty of Medicine, or Universitas Gadjah Mada.

Tropical Medicine Journal is published in June and December by the Faculty of Medicine, Universitas Gadjah Mada.

Submission of papers

Articles shoul be submitted in both hard copy and soft copy forms or in electronic form through e-mails as attachment to: The Editor-in-Chief, Tropical Medicine Journal, Faculty of Medicine, Universitas Gadjah Mada, Sekip Utara, Yogyakarta 55281, Phone: 0274-588483, Fax: 0274-588483 E-mail: **tropmedjournal@gmail.com**

Basic requirements for articles submitted to Tropical Medicine Journal are: a) original work; b) have not been previously published and not under consideration for publication elsewhere and if accepted will not be published elsewhere; c) should have obtained approval from the Ethics Committee; d) must obtained signed informed consent from subjects for articles involving human subjects.

Referee suggestions

Upon submission, the author should provide one cover letter. In the covering letter, authors should suggest names and addresses (including e-mail) of at least three experts in the field for evaluation of article. The choice of referees will however remain with the editorial board.

Language

Tropical Medicine Journal will publish the articles in English. Editors encourage authors to submit their articles in English. Even so, when a language barrier is encountered, editors allow authors to submit their article in Bahasa Indonesia and it will be translated in English by in-house translator.

Typescripts

Articles should be neatly typed in Times New Roman, 12 pt, double-spaced on A4 format with 3 cm on all margins. Receipt of papers will be acknowledged. Authors will be informed of the referee's comments.

Article types

Three types of articles may be submitted: a) Original research article (maximum: 25 pages, 35 references); b) Review article (maximum: 40 pages, 100 references); c) Case Report article (maximum: 10 pages, 20 references)

Proofs and Reprints

Proofs of manuscript will be sent to the author for approval prior to publication. Page proofs are considered to be the final version of the manuscript. With the exception of typographical or minor clerical errors, no changes will be made in the manuscript at the proof stage. Corrections should be returned to the Editor within one week. Authors of accepted article will receive 10 free off prints of their articles and can place order for additional off prints or hard copy of the journal after the acceptance of the articles.

Copyright

Submission of an article for publication implies to the transfer of the copyright from the author(s) to the publisher upon acceptance. Accepted articles become the permanent property of Tropical Medicine Journal and may not be reproduced by any means without the written consent of the Editor-in-Chief.

Manuscript preparation

The format of the typescript should be as follows:

a. ***Title and authors***: The title should be a brief phrase describing the contents of the article. The title page should include the author's full names and affiliation that marked Arabic number. The name of the corresponding author should be indicated with postal adresse, phone, fax and e-mail information.

b. ***Abstract*****:** The author should provide two abstract, in Indonesian and English language. All articles should be provided with an sbstract of between 200-300 words in one spacing. The abstract should be written in simple language with structured abstract style. Abstract should describe of the study using below headings: Introduction, Objectives, Methods, Results and Discussion, and Conclusion. Standard nomenclature should be used and abbreviations should be avoided.

c. ***Keywords*****:** A maximum of 5 keywords must be given at the end of the abstract.

d. ***Introduction***: The Introduction should provide the problem statement clearly, the relevant literature on the subject, and the proposed approach or solution.

e. ***Materials and methods*****:** The materials and methods should be clear enough to allow experiments to be reproduced. Previously published research procedure should be cited, and important modifications of it should be mentioned briefly. If the conducted research involved the use of human subjects or animal laboratory, it should be stated that the clearance from the Research Ethics Committee was obtained. The Editor may request a copy of the clearance document or informed consent form for verification.

f. ***Results and Discussion*****:** The Results should be presented with clarity and precision and explained without referring to the literature. The original and important findings should be stated. The Results should be illustrated with figures or tables where necessary but these should be kept to the minimum. The Discussion should interpret the findings in view of the results obtained against the background of existing knowledge. The Discussion should highlight what is new in the paper. Any assumption on which conclusions are made must be stated clearly

g. ***Conclusions:*** State the Conclusions in a few sentences at the end of the paper.

h. ***Acknowledgments***: The Acknowledgments should be presented at the end of the text and before the references. Technical assistance, financial support and advice may be acknowledged.

i. ***Tables:*** The tables should be kept to a minimum and be designed to be as simple as possible. Each table should be numbered consecutively in Arabic numerals and supplied

with a heading and a legend. Tables should be self-explanatory without reference to the text.

j. ***Figure:*** The figures should be numbered consecutively with Arabic numerals. Graphics should be prepared using applications capable of generating high resolution GIF, TIFF, JPEG or Powerpoint before pasting in the Microsoft Word manuscript file. The figures should be constructed in such a manner that they can be understood without reading the text. Appropriate symbols should be used on graphs and explained in the legends. Graphs should not duplicate results presented in tables. Title and comments of the figures and photographs should be provied on separate page using MS Word.

k. ***References***: References should be numbered consecutively in the order in which they are first mentioned in the text (Vancouver style). Identify references by Arabic number as superscript in order of appearance. A number must be used even if the author(s) is named in the text. The original nurmber assigned to the reference is reused each time the reference is cited in the text, regarless of its provious position in the text. For example :

..... it has been reported[1] .....

..... according to Sardjito[2] .....

..... Winstein & Swartz[3] conducted .....

..... by Avon *et al*.[4] .....

Authors are responsible for the accuracy and the completeness of their references. References should be listed numerically (Vancouver style) at the end of the text and in the same order that they have been cited in the text. For citation references with six or less authors, all authors should be listed, when seven or more authors only first three authors should be listed followed by et al. Journal names are abbreviated according to Index Medicus and Index of Indonesia Learned Periodicals (PDIN 1974). References to journal articles, books, chapters in books, theses, etc. should be listed as given in Sample References.

Sample References

Scientific Journal

1. *Standard journal article*

   You CH, Lee KY, Chey RY, Menguy R. Electro-gastro-graphic study of patients with unexplained nausea, bloating and vomiting. Gastroenterology 1980; 79(2):311-14.

   Goate AM, Haynes AR, Owen MJ, Farral M, James LA, Lai LY, et al. Predisposing locus for Alzheimer's disease on chromosome 21. Lancet 1989;1:352-55.

2. *Organization as author*

   The Royal Marsden Hospital Bone-marrow Transplantation. Team. Failure of syngeneic bone-marrow graft without preconditioning in post-hepatitis marrow aplasia. Lancet 1977;2:742-44.

3. *No author given*

   Coffee drinking and cancer of the pancreas [editorial]. BMJ 1981;283-628.

4. *Article not in English*

   Massone L, Borghi S, Pestarino A, Piccini R, Gambini C. Localisations palmaires purpuriques de la dermatite herpetiforme. Ann Dermatol Venereol 1987;114:1545-47.

5. *Volume with supplement*

   Magni F, Rossoni G, Berti F, BN-52021 protects guinea-pig from heart anaphylaxis. Pharmacol Res Commun 1988;20 Suppl 5:75-78.

6. *Issue with supplement*

   Gardos G, Cole JO, Haskell D, Marby D, Paine SS, Moore P. The natural history of tardive dyskinesia. J Clin Psychopharmacol 1988;8(4 Suppl):31S-37S.

7. *Volume with part*

   Hanly C. Metaphysics and innateness: a psychoanalytic perspective.Int J Psychoanal 1988;69(Pt 3):389-99.

8. *Issue with part*

   Edwards L, Meyskens F, Levine N. Effect of oral isotretinoin on dysplastic nevi. J Am Acad Dermatol 1989;20(2 Pt 1):257-60.

9. *Issue with no volume*
   Baumeister AA. Origins and control of stereotyped movements. Monogr Am Assoc Ment Defic 1978; (3):353-84.
10. *No issue or volume*
    Danoek K. Skiing in and through the history of medicine. Nord Midicinhist Arsb 1982;86-100.
11. *Pagination in roman numerals*
    Ronne Y. Ansvarfall. Bloodtransfusion till fel patients. Vard-facket 1989;13:XXVI-XXVII.
12. *Type of article indicated as needed*
    Spargo PM, Manners JM, DDAVP and open heart surgery [letter]. Anaesthesia 1989;44: 363-64.
    Fuhrman SA, Joiner KA. Binding of the third component of complement C3 by Toxoplasma gondii [abstract]. Clin Res 1987; 35:475A.
13. *Article containing retraction*
    Shishido A. Retraction notice: Effect of platinum compounds on murine lymphocyte mitogenesis [Retraction of Alsabti EA, Ghalib ON, Salem MH. In: Jpn J Med Sci Biol 1979; 32:53-65). Jpn J Med Sci Biol 1980;33:235-37.
14. *Article retracted*
    Alsabti EA, Ghalib ON, Salem Mh. Effect of platinum compounds on murine lymphocyte mitogenesis [Retracted by Shishido A. In: Jpn J Med Sci Biol 1980;33:235-7]. Jpn J Med Sci Biol 1979;32:53-65.
15. *Article containing comment*
    Piccoli A, Bossatti A. Early steroid therapy in IgA neuropathy: still open question [comment]. Nephron 1989;51:289-91.
16. *Article in comment*
    Kobayashi Y, Fujii K, Hiki Y, Tateno S, Kurokawa A, Kamiyama M. Steroid therapy in IgA nephropathy: a retrospective study in heavy proteinuric cases [see comments]. Nephron 1988;48:12-7. Comment in: Nephron 1989;51:289-91.
17. *Article with published erratum*
    Schofield A. The CAGE questionnaire and psychological health [published erratum appears in Br J Addict 1989;84:701]. Br J Addict 1988;83:761-64.

Books and Other Monographs

18. *Personal author(s)*
    Colson JH, Armour WJ. Sports injuries and their treatment. 2nd rev. ed. London: S. Paul, 1986.
19. *Editor(s) as author*
    Diener HC, Wilkinson M, editors. Drug-induced headache. New York: Springer-Verlag, 1988.
20. *Organization(s) as author*
    Virginia Law Foundation. The medical and legal implications of AIDS. Charlottesville: The Foundation, 1987.
21. *Chapter in a book*
    Winstein L, Swartz MN. Pathologic properties of invading microorganisms. In: Sodeman WA Jr, Sodeman WA, editors. Pathologic Physiology, mechanisms of disease. Philadelphia: Saunders, 1974:457-72.
22. *Conference proceedings*
    Vivian VL, editor. Child abuse and neglect: a medical community response. Proceedings of the First AMA National Conference or Child Abuse and Neglect; 1984 Ma 30-31; Chicago. Chicago: American Medical Association, 1985.
23. *Conference paper*
    Harley NH. Comparing radon daughter dosimetric and risk models. In:Gammage RB, Kaye SV, editors. Indoor air and human health. Proceedings of the Seventh Life Sciences Symposium; 1984 Oct 29-31; Knoxville (TN). Chelsea (MI):Lewis, 1985:69-78
24. *Scientific or technical report*
    Akutsu T. Total heart replacement device. Bethesda (MD): National Institutes of Health. National Heart and Lung Institute; 1974 Apr. Report No.:NIH-NIHI-69-2185-4.
    Disertasi Youssef NM. School adjustment of children with congenital heart disease [dissertation]. Pittsburg (PA): Univ. of Pittsburg, 1988.

25. *Dissertation*
    Kay JG. Intracellular cytokine trafficking and phagocytosis in macrophages [Dissertation]. St Lucia, Qld: University of Queensland; 2007.
26. *Patent*
    Harred JF, Knight AR, McIntyre JS, inventors. Dow Chemical Company, assignee. Epoxidation process. US patent 3,654,317, 1972 Apr 4.

Other Published Material

27. *Newspaper article*
    Resberger B, Specter B. CFCs may be destroyed by natural process. The Washington Post 1989 Aug 7;Sect. A:2(col. 5).
28. *Audiovisual material*
    AIDS epidemic: the physician's role [videorecording]. Cleveland (OH): Academy of Medicine of Cleveland, 1987.
29. *Computer program*
    Renal system [computer program]. MS-DOS version. Edwardsville (KS): Medi-Sim, 1988.
30. *Legal material*
    Toxic Substances Control Act: Hearing on S. 776 Before the Subcomm. on the Environment of the Senate Comm. on Commerce, 94th Cong., 1st Sess. 343(1975).
31. *Map*
    Scotland [topographic map]. Washington: National Geographic Society (US), 1981.
32. Dictionary or Encyclopaedia
    Ectasia. Dorland's illustrated medical dictionary. 27th ed. Philadelphia: Saunders, 1988: 527.
33. *Classic material*
    The Winter's Tale: act 5, scene I, lines 13-16. The complete works of William Shakespeare. London: Rex, 1973.
34. *In press*
    Lillywhite HB, Donald JA. Pulmonary blood flow regulation in an aquatic snake. Science. In press.

Electronic Material

35. *Journal articel in the internet*
    Morse SS. Factors in the emergence of infectious diseases. Emerg Infect Dis [serial online] 1995 Jan-Mar [cited 1996 Jun 5];1(1):[24 screens]. Available from: URL: http://www.cdc.gov/ncidod/EID/eid.htm
36. *Monograph in electronic format*
    CDI, clinical dermatology illustrated [monograph on CD-ROM]. Reeves JRT, Maibach H. CMEA Multimedia Group, producers. 2nd ed. Version 2.0 San Diego: CMEA; 1995.
37. Computer program
    Hemodynamics III: the ups and downs of hemodynamics [computer program]. Version 2.2. Orlando (FL): Computerized Educational System; 1993.

We thank to the reviewers of this edition:

dr. Abu Tholib, M.Sc., Ph.D., Sp.MK
dr. Ahmad Hamim Sadewa,Ph.D
dr. Arta Farmawati, Ph.D
dr. Elizabeth Henny Herningtyas, M.Si, Ph.D
Dr. Dra. Erna Kristin, Apt., M.Si.
dr. Hanggoro Tri Rinonce, Ph.D
dr. M. Lutfan Lazuardi, M.Kes., Ph.D
dr. Titik Nuryastuti, Ph.D, Sp.MK
dr. Tri Wibawa, Ph.D
Dra. Raden Ajeng Yayi Suryo Prabandari, M.Si., Ph.D