Knowledge, attitudes and practices of a selected group of parents on pre-hospital management of fever in children in a dengue-endemic area of Southern Sri Lanka

Wickremasinghe IKM[1], Basnayake ANK[2], Shantha Kumara DK[3], Kodikara Arachchi DS[1]

[1]*Teaching Hospital Karapitiya, Sri Lanka.*
[2]*District Hospital Karandeniya, Sri Lanka.*
[3]*Base Hospital Kamburupitiya, Sri Lanka.*

Correspondence: Dr. I. K. M. Wickremasinghe
e-mail: *indumini123@gmail.com*
https://orcid.org/0000-0002-5644-5426
Submitted on 30.03.2020 and accepted for publication on 22.10.2020

ABSTRACT

Introduction: Dengue is one of the hyperendemic diseases in Sri Lanka with high morbidity and mortality. This study was aimed to assess knowledge, attitudes and practices of group of parents on pre-hospital management of fever in their children.

Methods: A cross-sectional study was conducted incorporating either one of the parents of 86 children with fever admitted to two paediatric units in Teaching Hospital Karapitiya and District General Hospital, Matara over two months during a dengue epidemic. A self -administered pretested questionnaire with demographic data and questions to assess knowledge, attitudes and practices regarding pre-hospital management of dengue was used.

Results: There were 81 (94.2%) females. The majority (69.76%) had educated beyond GCE O/L. Only 27.9% knew that they have a risk of dengue. The majority (66.28%) had excluded dengue due to the presence of respiratory symptoms. More than half of the parents (55.81%) knew that treatment with NSAIDs could aggravate dengue but 32.56% preferred NSAIDs, due to misconception of pyrexia related cerebral injury. A large majority (89.53%) knew proper hydration is needed and had hydrated their children. However, only 33.72% knew that hospital admission is needed if fluid intake is inadequate and only 19.77% knew that hospitalisation is needed if urine output is low. Only 30.23% knew that full blood count (FBC) should be done on day 3 of illness and 45.34% of the participants had got it done before admission. The majority (65.1%) knew dengue NS1 antigen test and out of them 75% had got it done before hospitalisation.

Conclusions: Despite living in an endemic area, only a few parents knew that their children were at a risk of contracting dengue. Inadequate knowledge about the symptoms, when to hospitalize and misconceptions on treatment of fever were highlighted. Therefore, educating the parents on specific facts is effective.

Keywords: *Attitudes, dengue fever, knowledge, practices, Sri Lanka.*

Introduction

Dengue virus infection is caused by four distinct, but closely related viruses, i.e., DENV-1, DENV-2, DENV-3 and DENV-4 which belong to the family Flaviviridae (1). *Aedes aegypti* and *Aedes albopictus* mosquitoes transmit these serotypes (1). It is the most prevalent mosquito-borne disease globally and considered as hyperendemic in Sri Lanka since all four serotypes circulate in urban areas (2).

In 2020, total dengue cases reported in Sri Lanka was 31,162. In 2020, the number of dengue cases reported in Galle and Matara districts were 1671 and 545 respectively and most of the cases were reported in the month of January (2.)

Manifestations of dengue virus infection range from asymptomatic infection to the fatal dengue Shock Syndrome (DSS) (1). Symptoms of dengue fever (DF) include fever, frontal or retro-orbital pain, rash, myalgia, arthralgia, rhinitis, cough, vomiting and generalised lymphadenopathy. Dengue haemorrhagic fever (DHF) has two phases. The relatively mild first phase is characterised by fever, malaise, vomiting, headache and cough. This is followed by the critical phase. Symptoms of critical phase includes low urine output, cold extremities, faintishness, abdominal pain, bloody diarrhoea and bleeding from other sites (3,4).

Under these circumstances, fever in children who are living in dengue-endemic areas should be carefully managed with the suspicion of DF/ DHF from the onset. Children still present to the hospital with poorly managed fever at home, e.g. Non-Steroidal Anti-Inflammatory drugs (NSAIDs) misuse and dehydration. NSAIDs can lead to haemorrhage and liver toxicity in dengue patients (5). Dehydration results in shock and multi organ failure (3,4). Therefore, Parents' role is essential for the initial management of fever at home and identification of the gaps in parents' knowledge, issues of their attitudes and malpractices are important to reduce the dengue morbidity and mortality.

When knowledge, attitudes and practices of pre-hospital management of dengue is considered, there is only one study reported in Sri Lanka to date. It is a community-based study which was carried out in a suburban area in Colombo district - Boralesgamuwa in 2005 / 2006 incorporating 349 participants. This study has shown that more than 50% of the participants were aware of the high fever, headache, myalgia, vomiting and rash as symptoms of dengue. However, only less than 50% of the sample was aware of cough, cold, diarrhoea, melaena and thrombocytopaenia as features of dengue infection. They have also shown that knowledge regarding the initial management of fever at home in the study sample was inadequate, only 2.2% were aware of the importance of adequate liquid intake (6).

There are two other studies conducted in Sri Lanka to assess the knowledge, attitudes and practices regarding dengue in general. A hospital-based descriptive cross sectional study was carried out in Teaching Hospital Peradeniya in 2015 incorporating 500 outpatients to assess knowledge and attitude regarding dengue. This study showed only 38% and 6.8% of the participants knew fever and bleeding as symptoms of dengue respectively (7). Another hospital-based cross-sectional descriptive study was conducted among dengue patients admitted to two medical units of Teaching Hospital, Jaffna in 2017 to assess knowledge, attitudes and practices regarding dengue. This study reported that fever as a symptom of dengue was stated by only 76 out of 200 participants. Forty-nine patients could identify two other classical symptoms and 75 patients could identify one other clinical feature of dengue (skin rash, bleeding tendency) (8). Interestingly, a community-based cross-sectional survey conducted in central Nepal in 2011 / 2012 incorporating 589 participants revealed that 99% of them knew fever as a symptom of dengue (9).

However, in the latter three studies, they have not assessed the knowledge, attitudes and practices in pre-hospital management of fever. Therefore, it seems that there is a knowledge gap in pre-hospital management of fever which is crucial to reduce the mortality and morbidity of dengue infection.

The aim of our study was to assess the knowledge, attitudes and practices on pre- hospital management of dengue among a group of parents whose children were admitted to two selected hospitals of the Southern province during a period of approximately two and a half months amidst of an epidemic. We believe that targeting parents of febrile children admitted to the hospital would give us a better picture to assess the knowledge, attitudes and practices on pre- hospital management of dengue.

Methods

A cross-sectional study was carried out incorporating either one of the parents of 86 children who were admitted with fever to two Paediatric units in Teaching Hospital Karapitiya and District

General Hospital, Matara in Southern Sri Lanka, from 20th January 2016 to 30th March 2016.

The participants were randomly recruited using the convenience sampling method. One parent of each child, either biological or non-biological, who was there as the bystander for the child was selected for data collection after obtaining their written informed consent and they were ensured of the freedom of withdrawal from the study at any stage. Each child whose parent was selected for data collection had a body temperature of more than 100 °F on admission to the hospital.

The project proposal was reviewed and approved by the Board of Study in Paediatrics of Postgraduate Institute of Medicine, Colombo and the ethical approval was obtained from the Ethics Review Committee of Faculty of Medicine, University of Ruhuna.

A pretested self-administered questionnaire with both open and close ended questions was used for data collection. The questionnaire included questions to gather demographic data, knowledge regarding symptoms of dengue and pre-hospital management of dengue including identification of indications to admit, investigations to be done and treatment for fever at home. There were 16 questions to assess knowledge component, 5 questions to assess practices and, 6 questions to assess attitudes. Data were analysed using SPSS Version 25 and $p < 0.05$ was considered as statistically significant.

Results

A total of 86 parents were recruited in the study. Out of the participants 94.2% (n = 81) were females and 5.8% (n = 5) were males. The baseline characteristics of the study sample are tabulated in table 1. The majority (39.5%) belonged to the age group of 30-35 years. Among the study participants 36% (n = 31) had passed the G.C.E. (Ordinary Level) examination, and 33.7% (n = 29) had education beyond that.

Table 1: The baseline characteristics of the study sample

	Number (N=86)	Percentage (%)
Gender		
Female	81	94.2
Male	05	05.8
Age groups (years)		
<20	00	00
20 - 25	13	15.1
25 - 30	4	4.7
30 - 35	34	39.5
35 - 40	18	20.9
>40	17	19.8
Level of education		
< Grade 5	2	2.3
Grade 5 - O/L	24	27.9
Passed O/L	31	36.0
Passed A/L	25	29.1
Graduate	4	4.7

Knowledge on the risk of acquiring dengue

Out of the total study sample 19.77% (n = 17) didn't know whether they were living in a dengue endemic area or not. Therefore, they did not know whether they were at risk or not. Among the participants 51.16% (n = 44) claimed that their children are not susceptible to dengue because there are no reported dengue patients in their neighbourhood or their children has had dengue infection in the past. Only 27.9% (n = 24) of the parents knew that they are living in a dengue endemic area and hence, their children are susceptible to dengue.

Knowledge regarding the diagnosis of dengue

Among the participants 66.28% (n = 57) had excluded dengue due to the presence of respiratory symptoms in their febrile children. Dengue was excluded by the presence of diarrhoea by 4.65% (n = 4) of the parents and by the presence of convulsions by 1.16% (n = 1) of the parents. Another 1.16% (n = 1) of parents had excluded dengue in their children due to the normal platelet count, which was observed in the early part of the illness.

Knowledge and practice regarding the pre-hospital management

Out of the participants 89.53 % (n = 77) knew that proper hydration is required for dengue patients, and all the parents who knew that had taken effort to hydrate their children. However, none of them knew that the fluids should be given according to the body weight (maintenance fluid volume). Therefore, none of them had asked their doctors about the volume of fluid they should give their children per hour.

Only 33.72% (n = 29) knew that hospital admission is required if fluid intake is inadequate, and only 19.77% (n = 17) knew that hospitalisation is mandatory if urine output is low. Of the participants who knew that adequate hydration is vital in dengue fever, only 32.47% (n = 25) knew that hospital admission is required if fluid intake is reduced, and only 20.78 % (n = 16) knew that hospitalisation is needed if urine output is low.

Knowledge and attitudes regarding the treatment with NSAIDs

Among the participants 55.81% (n = 48) knew that treatment with antipyretics other than paracetamol i.e. NSAIDs could aggravate dengue. Out of them NSAIDs induced liver damage was known to 58.33% (n = 28) and the risk of haemorrhage was known to 16.67% (n = 8). There was a significant association between knowledge of side effects of NSAIDs and their use ($p = 0.022$).

Out of all study subjects 32.56% (n = 28) had the misconception of high fever-induced cerebral injury and that was the main reason for them to request from their doctors for drugs other than paracetamol to reduce fever. More than a quarter of the subjects (27.9%) requested antipyretics other than paracetamol from their doctors because they could not bear the discomfort of their children undergoing due to fever. Only 6.98% of subjects were happy to treat their children with NSAIDs because of the fear of febrile convulsion. Mere 2.33% wanted to give NSAIDs as it was recommended by the doctor.

Knowledge and practices on investigations

Out of the study subjects, 30.23% (n = 26) knew that full blood count (FBC) should be done in a febrile child on day 3 of illness; and 30.23 % (n = 26) chose a day other than day 3. Only 18.60% (n = 16) did not know when to do the FBC. Thirty-nine children (45.34%) had undergone FBC prior to hospital admission. Majority of them (89.74%, n = 35) had done FBC as it was requested by the doctor. Among participants only 10.26% (n = 4) had done FBC as they knew that it should be done in febrile children.

A significant percentage 65.1% (n = 56) knew about the dengue NS1 antigen test. Surprisingly, most of the participants were educated about that by the media (53.58%) and 41% were educated by the doctor. Out of the parents who knew about dengue NS1 antigen test, 75% (n = 42) had got it done to their febrile children.

Discussion

In Sri Lanka, except for our study, only one other study has been reported to date to study the knowledge, attitudes and practices of dengue pre-hospital management.

Our study reveals several important facts. We found that most of the parents had excluded dengue in their febrile children due to the presence of respiratory symptoms and some have excluded it as their children had diarrhoea, convulsions or normal platelet count which can be present in the early part of the illness. Gunasekara TDCP *et al.* also reported that most people were unaware about cough, cold and diarrhoea as symptoms of dengue infection. According to their study, only 1.72% of the sample was aware that diarrhoea can occur in DF/DHF. Cough as a symptom was recognised by 15.47% of their sample and cold was known as a symptom by 1.43% of their sample (6). Therefore, there is a high risk of poor domestic management of dengue patients who are having these symptoms before admission to the hospital. Moreover, a child who is having dengue with concurrent diarrhoea has a high risk of getting dehydrated. If the diarrhoea continues during the critical phase or dehydration which the patient has had in the febrile phase persists in to the critical phase, the risk of hypovolaemic shock and multi-organ failure rises (4).

The large majority (89.53%) of our participants were aware of the importance of the adequate hydration and had hydrated their children. In contrast to that, Gunasekara TDCP *et al.* reported that only 2.2% of their samples were aware of the importance of fluid intake (6). Kumanan *et al.* also found that out of their 200 participants only nine patients thought that drinking water was effective (8). However, none of our participants were aware that maintenance fluid volume needs to be given at home before hospital admission. Therefore, there is a risk of dehydration due to inadequate input and risk of fluid overload if large volumes were given during the critical phase before the hospital admission.

Most of them were unaware of specific facts in the pre-hospital management, such as the necessity for the hospitalisation of the child if the child's fluid intake is inadequate or urine output is low.

Jayalath T *et al.* showed that only 24.2% of their sample knew that they should avoid aspirin (7). In contrast, Gunasekara TDCP *et al.* reported that only 6% of their sample had recognised aspirin as a safe drug to treat dengue patients (6). In our study, 55.81% of the participants were aware that NSAIDs can aggravate the condition in dengue patients. However, only 16.67% our sample were aware of NSAIDs induced haemorrhage in dengue patients. In our questionnaire we referred NSAIDs as drugs other than paracetamol to reduce fever since some parents do not know them by names or by category. Most of the parents who knew about those adverse effects had not requested drugs other than paracetamol from their doctors. Therefore, educating the parents on specific facts is effective.

In our study, the main reason for the parents to treat their febrile children with NSAIDs was a myth of high fever- induced cerebral injury. Dengue infection causes a high fever which usually doesn't respond to paracetamol. Hence, there is a high risk of treating the children with NSAIDs when the parents do not suspect dengue and do not know about side effects of NSAIDs and when they believe the myth.

Even though FBC is a widely available test, most of the people were not aware that it should be done on day 3 of the illness and they had not done it. Most of the people were aware about dengue NS1 antigen and their practice was also high. Most of them have gained knowledge about the dengue NS1 antigen test through the media.

Kumanan *et al.* also reported that media as the main method of raising the public awareness. Thirty seven percent of their respondents were educated by the media while 36% patients have acquired knowledge from healthcare personnel (8). Dhimal M *et al.* who conducted their research in Central Nepal, also reported media as the major source of information. Eighty three percent of their participants had heard of DF through the radio and 81% by television (9). In contrast, Malhotra *et al.* who carried out their research in the rural and slum communities in a city in North India reported that 44.87% of their participants were educated about dengue by health professionals and only 32.75% were educated by media (10). This might be due to the socioeconomic background of their sample.

Limitations

There are some limitations of our study. Our sample size is small due to several reasons. Firstly, some hospitalised children were looked after by guardians who did not know how the children were managed at home. They were excluded from the study. Secondly, some parents who were caring for the children in the hospital were anxious due to their children's condition, sleep deprived and exhausted due to the day and night hourly oral fluid administration and the frequent measurement of urine output. Therefore, they were not in a good psychological state to answer the questions and were excluded from the study. Further, some of the participants' responses might have been influenced by information that they had received from the health staff after hospital admission.

Conclusions

Knowledge, practice and attitude on pre-hospital management of dengue, which is a cornerstone to reduce the dengue morbidity and mortality, is deficient in some areas. Hence more public awareness programs concentrating more on pre-hospital management should be conducted

providing specific information and mass media can be used effectively for this purpose. Furthermore people should be more educated regarding the myths circulating among them.

Acknowledgements

We are grateful to Dr. Champa Wijesinghe (Department of Community Medicine, Faculty of Medicine, University of Ruhuna) for advice on analysis of data. We also like to thank Dr. Dilini Gamage for her assistance in the data collection for the study.

References

1. WHO. Prevention and control of dengue and dengue haemorrhagic fever: comprehensive guidelines. *WHO Regional Publication,* 2011.
2. Epidemiology Unit, Ministry of Health, Sri Lanka. Available from: https://www.epid.gov.lk/web/index.php?option=com_casesanddeaths&Itemid=448&lang=en (Accessed on March 2021)
3. Kliegman RM, Stanton B, St. Geme JW, Schor NF. Nelson Text Book of Pediatrics (20th edition), Elsevier; 2015.
4. Guidelines on Management of Dengue fever and Dengue Haemorrhagic fever in children and Adolescents, Ministry of Health Sri Lanka, 2012. Available from: https://www.epid.gov.lk/web/images/pdf/Publication/gmdfca12.pdf
5. Wijewickrama A, Abeyrathna G, Gunasena S, *et al.* Effect of non-steroidal anti-inflammatory drugs (NSAIDS) on bleeding and liver in dengue infection. *International Journal of Infectious Diseases.* 2016; 45(Suppl 1): 19-20. DOI: https://doi.org/10.1016/j.ijid.2016.02.077.
6. Gunasekara TDCP, Velathanthri VGNS, Weerasekara MM, *et al.* Knowledge, attitudes and practices regarding dengue fever in a suburban community in Sri Lanka. *Galle Medical Journal.* 2012; **17**(1): 10-17. DOI: http://dx.doi.org/10.4038/gmj.v17i1.4355.
7. Jayalath T, Ralapanawa U, Karunaratne S, *et al.* Knowledge and Attitude Regarding Dengue Fever among the Outdoor Patients of the Teaching Hospital Peradeniya, Sri Lanka. *International Journal of Medical Research & Health Sciences.* 2018; **7**(1): 77-84.
8. Kumanan T, Logeswaran D. A study on knowledge, attitude and practice regarding dengue among hospitalised patients from Northern Sri Lanka. *Sri Lankan Journal of Infectious Diseases.* 2018.8(2), pp.127–132. DOI: http://doi.org/10.4038/sljid.v8i2.8220.
9. Dhimal M, Aryal KK, Dhimal ML, *et al.* Knowledge, Attitude and Practice Regarding Dengue Fever among the Healthy Population of Highland and Lowland Communities in Central Nepal. PLoS One. 2014; **9**(7): e102028. DOI: 10.1371/journal.pone.0102028.
10. Malhotra G, Yadav A, Dudeja P. Knowledge, awareness and practices regarding dengue among rural and slum communities in north Indian city, India. *International Journal of Medical Sciences and Public Health.* 2014; **3**(3):295-299. DOI: https://doi.org/10.5455/ijmsph.2013.181220132.