



# Post Dengue Fatigue Syndrome (PDFS) among Dengue IgM-Antibody Positive Patients at Batticaloa Teaching Hospital, Sri Lanka

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## Abstract

Dengue virus infection has varying clinical manifestation ranging from asymptomatic infection to life-threatening hemorrhagic fever and dengue shock syndrome. There are a number of rare presentations that were reported in the last outbreak in 2017. However, long-term consequences of dengue fever were reported worldwide, but Sri Lanka is not an exception. One of the long-term displays is post dengue fatigue syndrome (PDFS). Post dengue fatigue syndrome (PDFS) is not an uncommon occurrence. It comprises of a variety of symptoms complex ranging from fatigue, muscle weakness and variable neurological abnormalities which have been reported in various parts of the world. We conducted the descriptive prospective study at Batticaloa Teaching Hospital, Sri Lanka. In this study, we collected data from the patient with serologically confirmed dengue infection. One month after discharge, follow-up study was conducted through telephone interview and validated fatigue questionnaire was filled. Fifty-two serologically positive patients were agreed and participated in this study: 21 (40.38%) males and 31 (59.61%) females. Out of the 52 patients, 9 had PDFS: 5 (55.5%) males and 4 (44.4%) females. Almost all PDFS patients were complained of muscle weakness, muscle pain and poor concentrations.

## Subject Areas

Infectious Diseases

## Keywords

Post Dengue Fatigue Syndrome, and Dengue Virus Infection

## 1. Introduction

Dengue is most commonly a self-limiting flu-like illness of low mortality which

can be asymptomatic or leads to life-threatening hemorrhagic shock. The disease is mainly transmitted by a type of mosquito called *Aedes aegypti* [1]. Dengue epidemics were reported throughout the 19<sup>th</sup> and 20<sup>th</sup> century in America, South Europe, North Africa, the Eastern Mediterranean, Asia, Australia, various islands in the Indian Ocean, the South and Central Pacific and the Caribbean [2]. Dengue fever is estimated by the World Health Organization (WHO) to cause about 50 - 100 million infections per year worldwide [2]. As the incidence of dengue increases, an incidence of atypical presentations also gets higher.

According to the Sri Lanka, epidemiology report stated that more than 2562 suspected dengue cases were admitted in the Teaching Hospital Batticaloa in the eastern part of the Sri Lanka in a period of first 4 months from 1<sup>st</sup> of January to 30<sup>th</sup> of April 2017 [3] [4]. Dengue epidemic is common in Asia and Pacific throughout the twentieth century. Evidence indicates the expansion of dengue endemic areas and consequently the exponential increase of dengue virus infection across the sub-tropics. It is characterized by an abrupt onset of fever often accompanied by a severe headache and pain behind the eyes, muscle pain and loss of appetite; however, spectrum of symptoms ranges from asymptomatic to severe dengue shock syndrome and organ failure [5]. A variety of atypical manifestations of dengue has been described, such as elevated liver enzymes, intracerebral hemorrhages, myocardial infarction [6] and acute appendicitis [7]. Interestingly, after febrile episode, some patients developed fatigue syndrome [1] (PDFS) of feeling tired or unwell after exertion, impaired memory or concentration, poor sleep, body pain, abdominal pain, excessive sweating [8], morning stiffness, and multiple arthralgia which were the most commonly reported symptoms [9].

Even though disabling long-term outcomes, such as transverse myelitis and Guillain-Barre syndrome, have been previously reported, this study highlights the evidence that dengue can result beyond the acute phases of infection [10] [11]. However, these may be under reported because of lack of knowledge and under diagnosis of dengue. Post dengue fatigue syndrome (PDFS) is not an uncommon phenomenon. It comprises of the spectrum of symptoms complex ranging from fatigue, muscle weakness and variable neurological abnormalities which have been reported in various parts of the world. This syndrome has been described both as sporadic illness and outbreaks. The cardinal features of the PDFS are muscular weakness and mental exhaustion. The muscular symptoms are mainly weakness with or without muscle pain. In contrast, neurological features include mental exhaustion, poor concentration, numbness of the feet and hands and frequent episode of excess sweating [9].

## 2. Methodology

This prospective descriptive study was conducted at Batticaloa Teaching hospital (BTH), Sri Lanka period of four months from 1<sup>st</sup> of January to 31<sup>st</sup> of April in 2017. We included patient with serologically (IgM-antibody) confirmed dengue

infection. During their admission at BTH clinical information and demographic data were harvested using a standardized questionnaire by trained interviewers. We clearly explained our follow-up study, which will be conducted by telephone interview. The follow-up telephone interview was performed one month after discharge. Validated fatigue questionnaire (FQ) was filled during the telephone interview. The FQ is a validated one, it consists of eleven items that measure fatigue related symptoms encompassing the physical and mental dimensions. The four response on mental fatigue and seven response on physical fatigue have four response categories (0 = none, 1 = mild, 2 = moderate, 3 = severe). Those who score higher imply more fatigue. The significant fatigue was defined when the FQ-score is 4 or more. In this study we included all male and female age over 12-year-old. We excluded those who have dengue IgM-antibody negative and those who have not willing to participate in our study. The informed written consent was taken from the patients and also the approval was taken from the head of the institution.

### 3. Results

Total 52 serologically dengue positive patients were enrolled in this study, 21 (40.38%) males and 31 (59.61%) females (**Table 1**). Out of 52 patients, 9 (17.3%) had features of PDFS, males were 5 (55.5%) and females were 4 (44.4%). Two-third of PDFS 6 (66.6%) were under category of 20 - 39 age group (**Table 1**). All, 9 PDFS patients score more than 10 out of 44. The mean FQ-score was 15.1. The physical fatigue symptoms are more prominent than mental fatigue. Almost all PDFS patients were complained of muscle weakness, muscle pain and poor concentrations (**Table 2**). Interestingly, 6 (66.6%) patients were complains of profuse sweating and feeling of fever.

### 4. Discussion

The fatigue is defined as a spectrum of symptoms, mainly from muscular and neurological origin. The muscular symptoms encompass muscle weakness with

**Table 1.** PDFS in relation with age and sex category.

Age	PDFS-present	PDFS-absent	Total
12 - 19	1	7	8
20 - 39	6	26	32
40 - 69	2	10	12
Total	9 (17.3%)	43 (82.7%)	52 (100%)
Sex			
Male	5	16	21
Female	4	27	31
Total	9 (17.3%)	43 (82.7%)	52 (100%)

**Table 2.** Clinical features of patient with PDFS.

Clinical features	N	%
Poor sleep	8	88.8%
Muscle weakness	9	100%
Sweating	6	66.6%
Poor concentration	9	100%
Muscular pain	9	100%
Feeling fever	6	66.6%
Numbness of limbs	5	55.5%
Morning stiffness	6	66.6%
Bloating	4	44.4%
Headache	4	44.4%
Abdominal pain	3	33.3%
Nausea	3	33.3%
Arthralgia	3	33.3%
Diarrhea	1	11.1%
Jaw pain	1	11.1%

or without pain. However, weakness is more obvious when patient do normal muscular effort [12]. The spectrums of neurological features are recorded in the available literature such as paresthesia in the limbs, and face, diplopia, blurred vision, headache, encephalitis, transverse myelitis, acute disseminated encephalopathy and myocitis [13]. The post-dengue neurological symptoms can be delayed by up to 2 weeks after the onset of fever and normally manifest as mono-neuropathies, polyneuropathies and Guillain-Barre syndrome [14]. The term Post infectious fatigue syndrome refers to severe and prolonged fatigue following infectious triggers, such as viruses, bacteria, and parasites [15]. Many people feel more tired even after long sleep. Throughout the fatigue low grade fever could be possible but most of the time patient feels feverish like feeling than recorded fever [16].

In this study, 17.3% of seropositive dengue patients had PDFS. This percentage was less than the study conducted in Singapore where PDFS was observed in 25% of hospitalized patients with dengue infection. Important risk factors for the development of fatigue included older age, female sex, the presence of chills and the absence of rashes [12]. However, in our study clearly showed that 5 (55.5%) male and 5 (44.5%) had PDFS and nearly two-third (66.6%) of PDFS were belongs to the age category of (20 - 39). This pattern can be explained that middle age male counterpart are more active, most of the time they are bread winners of their family and more vulnerable group for mosquito bite.

When we consider clinical presentations of PDFS, there are spectrums of clinical features mainly muscular and neurological origin. Muscular weakness and

mental exhaustion are the hallmark of PDFS. In this study almost all patients with fatigue complained of muscle weakness, muscular pain and poor concentration. In addition to that, 8 (88.8%) patients complained of poor sleep. However, 66.6% of patients with fatigue complained of excess sweating, morning stiffness and feeling of fever in the absence of recorded fever. The exact mechanism of PDFS is not fully understood, but we believed that cytokines play major role in the mechanism of PDFS. However, we don't know exactly which cytokines play major role [17].

## 5. Conclusion

Evaluating and managing PDFS is a challenging condition for physicians as it is a challenging and difficult condition for patients. A biopsychosocial approach in the evaluation and management is recommended. In future, more studies about PDFS manifestations, evaluation, and management are needed to better understand this post infectious fatigue in dengue infection.

## Limitations of the Study

Our study has several limitations. First, only 52 seropositive dengue patients were enrolled in this study. This is fairly small population, and also concurrent co-infections were not excluded. Second, we don't have the premorbid psychological status. Third, patients with asymptomatic or mild severity of dengue patients who do not require hospitalization were not studied. While, interviewed through telephone, most of the people are nervous while answering our questions. This is our cultural behavior. In addition, we are unable to assess their facial appearance.

## Conflict of Interest

None declared by the author.

## Availability of Data and Material

All data gathered during this study are included in this published article.

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## References

- [1] Kularatne, S.A.M. (2015) Dengue Fever. *BMJ*, **351**, h4661.
- [2] World Health Organization. (2009) Dengue: Guidelines for Diagnosis, Treatment, Prevention, and Control. Special Programme for Research and Training in Tropical Diseases.
- [3] Umakanth, M. (2017) Dengue Outbreak in Eastern Part of the Sri Lanka, Study Conducted in Teaching Hospital Batticaloa, Sri Lanka. *Saudi Journal of Medical and Pharmaceutical Sciences*, **3**, 568-570.

- [4] Ministry of Health Sri Lanka. (2012) Guidelines on Management of Dengue Fever & Dengue Haemorrhagic Fever in Adults. [http://www.epid.gov.lk/web/images/pdf/Publication/guidelines\\_for\\_the\\_management\\_of\\_df\\_and\\_dhf\\_in\\_adults.pdf](http://www.epid.gov.lk/web/images/pdf/Publication/guidelines_for_the_management_of_df_and_dhf_in_adults.pdf)
- [5] Hadinegoro, S.R.S. (2012) The Revised WHO Dengue Case Classification : Does the System Need to Be Modified ? 33-38.
- [6] Umakanth, M. (2017) Dengue Fever Complicated with Non-STEMI. *Saudi Journal of Medical and Pharmaceutical Sciences*, **3**, 704-706.
- [7] Umakanth, M. (2017) Spectrum of Rare Presentation of Dengue Viral Infection in Srilanka—A Case Series and Review of Literature. *Scholars Journal of Medical Case Reports*, **5**, 394-397.
- [8] Umakanth, M. (2017) Battle against Dengue with Batticaloa Model, Study Conducted in Teaching Hospital Batticaloa-Srilanka. *International Journal of Current Medical and Pharmaceutical*, **3**, 2186-2189.
- [9] Umakanth, M. (2017) Post Dengue Fatigue Syndrome. *International Journal of Current Medical and Pharmaceutical*, **3**, 2230-2231.
- [10] Patey, O., Ollivaud, L. and Breuil, J.L.C. (1993) Unusual Neurologic Manifestations Occurring during Dengue Fever Infection. *The American Journal of Tropical Medicine and Hygiene*, **48**, 793-802. <https://doi.org/10.4269/ajtmh.1993.48.793>
- [11] Seet, R.C. and Lim, E.C.W.-S.E. (2006) Acute Transverse Myelitis Following Dengue Virus Infection. *Journal of Clinical Virology*, **35**, 310-312. <https://doi.org/10.1016/j.jcv.2005.08.006>
- [12] Seet, R.C.S., Quek, A.M.L. and Lim, E.C.H. (2006) Post-Infectious Fatigue Syndrome in Dengue Infection. *Journal of Clinical Virology*, **38**, 1-6. <https://doi.org/10.1016/j.jcv.2006.10.011>
- [13] Aggarwal, A., Kumar, P. and Faridi, M.M.A. (2017) Case Report Neurological Manifestation as Presenting Feature of Dengue Infection. *Journal of Pediatric Neurosciences*, **10**, 112-113.
- [14] Patey, O., Ollivaud, L. and Breuil, J.L.C. (1993) Unusual Neurologic Manifestations Occurring during Dengue Fever Infection. *The American Journal of Tropical Medicine and Hygiene*, **48**, 793-780. <https://doi.org/10.4269/ajtmh.1993.48.793>
- [15] Kondo, K. (2006) Post-Infectious Fatigue. *JAMA*, **49**, 27-33.
- [16] Umakanth, M. (2017) Post Dengue Fatigue Syndrome. *Saudi Journal of Medical and Pharmaceutical Sciences*, **3**, 858-861.
- [17] Garcia, M.N., Hause, A.M., Christopher, M. and Walker. (2014) Evaluation of Prolonged Fatigue Post-West Nile Virus Infection and Association of Fatigue with Elevated Antiviral and Proinflammatory Cytokines. *Viral Immunology*, **27**, 327-333.