Original Research Article

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20201997

Dengue fever: a re-emerging disease

Sukhmeet Minhas^{1*}, Maninder Pal Singh Pardal²

¹Officer Commanding, Station Health Organisation, Kirkee

Received: 19 February 2020 Revised: 03 April 2020 Accepted: 04 April 2020

*Correspondence: Dr. Sukhmeet Minhas,

E-mail: sukhmeetminhas@yahoo.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Dengue is a rapidly spreading mosquito borne disease. Dengue is now endemic in 100 countries worldwide.

Methods: Cross sectional descriptive study design was used by the workers. We The workers obtained detailed information from each reported case. Active case finding by surveys during the period of the outbreak, besides a detailed environmental survey was also carried out. Standard statistical tools like calculating relative risk and Chi square were utilised for data analysis.

Results: In all 17 cases who fulfilled the case definition criteria were admitted in the month of September 2019. Out of these 16 (94.11%) were confirmed by NS 1 Antigen ELISA, while 01 (05.88%) was probable case. The first case reported on 08 Sep 2019, followed by a sudden spurt in the number of cases. The weekly epidemic curve is depicted in (Figure 1). There were no complications or fatalities. Detailed environmental assessment of the area revealed Aedes mosquito breeding in artificial containers of water. The house index of 7.06%, while the container index was 6.06%.

Conclusions: The above study thus highlights the necessity of strict environmental monitoring by all authorities concerned in the country to prevent morbidity and mortality due to Dengue fever and other mosquito borne diseases. The menace of Dengue fever will continue till we learn to manage our solid waste properly, as Dengue is after all a man-made disease due to improper solid waste disposal.

Keywords: Outbreak, Dengue fever, House index, Container index, Aedes

INTRODUCTION

Dengue is a rapidly spreading mosquito borne disease. Dengue is now endemic in 100 countries worldwide. India has reported several fold increases in number of Dengue cases in the decade. A considerable number of cases of dengue fever occurred in the population of a small town in western Maharashtra in the month of September 2019. Fortunately, the outbreak was controlled timely by proactive action initiated by the health authorities. In this paper, we aim to share the challenges faced in controlling the outbreak, lessons learnt during

our exercise; and recommend suitable preventive measures to prevent similar occurrences in future.

METHODS

Cross sectional descriptive study design was used by the workers. We carried out the study in the month of Sep 2019 in a small town of western Maharashtra, India. The workers obtained detailed information from each reported case, including the date of onset of symptoms, date of admission, movement history during the incubation period, and other relevant data. Active case finding by

²Deputy Assistant Director Health, HQ 41 Artillery Division, C/o 56 APO

surveys during the period of the outbreak was also carried out

Cases of dengue fever have been reported from this town in earlier years also. In the year 2015, 2016, 2017 and 2018, only 09, 11, 14 and 10 cases were reported, respectively. In the year 2019 in a short span of 15 days from 08 to 23 September, 17 cases of dengue fever were reported. This is clearly far in excess of the expected number of cases and constitutes an outbreak. The study team reviewed all the cases which were admitted to the local hospital. This included eliciting a detailed clinical and epidemiological history.

Sudden onset fever with chills, intense headache, muscle and joint pains, retro-orbital pain, nausea, vomiting, extreme weakness, colicky pain and abdominal tenderness, dragging pain in inguinal region, sore throat, general depression, anorexia, restlessness, lethargy, constipation, altered taste sensation and photophobia constituted the clinical case definition of dengue fever. Any case having three or more of the above symptoms was taken as a probable case. 1,2 A case compatible with clinical description with positive NS1 Antigen ELISA test was taken as a confirmed case. 1,3 The outbreak was studied and analysed in terms of time, place and person distribution of the cases. The workers also conducted a detailed environmental survey. Ethical clearance from the institutional ethical committee was obtained prior to collection of data. Standard statistical tools were utilised for data analysis.

RESULTS

In all 17 cases who fulfilled the case definition criteria were admitted in the month of September 2019. Out of these 16 (94.11%) were confirmed by NS 1 Antigen ELISA, while 01 (05.88%) was probable case. At the time of admission 15 (88.23%) cases presented with moderate to high grade fever (mean temperature 101.7°F), 11 (64.70%) had intense headache, 7 (41.17%), 15 (88.23%) had muscle and joint pain and 3 (17.64%) had vomiting. On laboratory investigations, 3 (17.64%) cases had leucopenia. The mean total leucocyte count was 6588/cu mm, while the mean lymphocyte count was 31.8%. The first case reported on 08 Sep 2019, followed by a sudden spurt in the number of cases. The weekly epidemic curve is depicted in (Figure 1). The median incubation period was approximately 3 days. There were no complications or fatalities. Age distribution of the cases is shown in (Table 1). Sex distribution of the cases is shown in (Table 2).

Detailed environmental assessment of the area revealed Aedes mosquito breeding in artificial containers of water, such as broken and discarded pots, flower pots with a plate below it, in close vicinity of the houses from where the cases were reported. The investigators carried out a quick survey of systematically selected houses in the station in order to assess the number of houses where Aedes larvae were found in water containers. In this case out of total 750 houses which were screened 53 were found to have Aedes mosquito breeding in and around them. This gives a house index of 7.06%. The number of containers which were found to have larvae or pupae was observed to give a container index of 6.06% Limited meteorological data was available locally. However, it was reported by the local population that it had rained intermittently for last nearly one month.

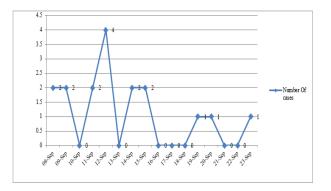


Figure 1: Epidemic curve.

Immediate preventive measures were instituted by the health officials who were deputed to visit the station. Proper disposal of all artificial containers of water was carried out. All possible breeding sites were identified and emptied of water collection. Outdoor fogging was also carried out.

Table 1: Age distribution of cases.

Age group (years)	Number of cases (%)
11-15	04 (23.53)
15-19	00 (00.00)
20-24	02 (11.76)
25-29	04 (23.53)
30-34	04 (23.53)
>35	03 (17.65)
Total	17 (100)

Table 2: Sex distribution of cases.

Sex	Number of cases (%)
Male	14 (82.35)
Female	03 (17.65)
Total	17 (100)

DISCUSSION

Dengue fever has re-emerged as a major public health problem in several parts of the world.^{3,4} Lim, Seydou, Carabali, Barro, Dahourou, Lee, et al reported several outbreaks of dengue in Burkina Faso.⁵ Khetan, Stein, Chaudhary, Rauniyar, Upadhyay, Gupta, et al first reported dengue fever in Nepal in 2004, which was followed by several major outbreaks.⁶ Huy et al reported

2922 patients in Vietnam in 2017.⁷ An unprecedented number of cases of dengue/dengue haemorrhagic fever were reported in Delhi from August to November 1996 with many deaths.⁸

In another study, Kunwar et al reported 266 cases of dengue fever in 2013. In their study fever was present in all cases (100%), body ache in 69.9% and headache in 49.2%, which differs from our results. Huy, Hoa, Thuy, Kinh, Ngan, Duyet, et al reported 31.3% cases with warning signs, 11.4% cases of severe dengue; and 0.8% mortality in their study of 2922 patients, which again differs from our study. Cariappa et al reported a house index of 5.38% and container index of 4.16% in their study, which is also different from our study.

The present outbreak was due to intermittent rain in the preceding month which contributed to Aedes mosquito breeding in peridomestic areas. Extensive health education of the local population on the subject was carried out and immediate preventive measures were instituted. Thus, the outbreak was controlled well in time, before it reached disastrous proportions.

CONCLUSION

Our study depicts how despite several massive outbreaks having occurred in the past both in India and abroad as complacency does set in regarding strict environmental monitoring to identify breeding sites, proper disposal of solid waste; and education of all concerned regarding mosquito borne diseases. The above study thus highlights the necessity of strict environmental monitoring by all authorities concerned in the country to prevent morbidity and mortality due to dengue fever and other mosquito borne diseases. The menace of dengue fever will continue till we learn to manage our solid waste properly, as dengue is after all a man-made disease due to improper solid waste disposal.

Recommendations

Prevention and control of dengue should be public health based besides routine anti-larval measures. The strategy should include: repeated and timely environmental survey of the entire area to assess breeding sites, behavioural survey of the population, continuous health education which should be reinforced from time to time, adequate coordination between various agencies, such as community, health agencies, and administrative

authorities at all times, fostering more research into development of a suitable vaccine for dengue.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

REFERENCES

- 1. Kunwar R, Prakash R. Dengue outbreak in a large military station: Have we learnt any lesson. Medical Journal Armed Forces India. 2015;71:11-14.
- 2. Park K. Park's Textbook of Preventive and Social Medicine. 23rd edn. 2015:264-75.
- 3. Mustafa MS, Rastogi V, Jain S, Gupta V. Discovery of fifth serotype of dengue virus (DENV-5): A new public health dilemma in dengue control. Medical J Armed Forces India. 2015;71:67-70.
- Chumpu R, Khamsemanan N, Nattee C. The association between dengue incidences and provincial-level weather variables in Thailand from 2001 to 2014. PLoS One. 2019;14(12):0226945.
- Lim JK, Seydou Y, Carabali M, Barro A, Dahourou DL, Lee KS, et al. Clinical and epidemiologic characteristics associated with dengue during and outside the 2016 outbreak identified in health facility-based surveillance in Ouagadougou, Burkina Faso. PLoS Negl Trop Dis. 2019;13(12):0007882.
- 6. Khetan RP, Stein DA, Chaudhary SK, Rauniyar R, Upadhyay BP, Gupta UP, et al. Profile of the 2016 dengue outbreak in Nepal. BMC Res Notes. 2018;11(1):423.
- 7. Huy BV, Hoa LNM, Thuy DT, Kinh VN, Ngan TTD, Duyet LV, et al. Epidemiological and Clinical Features of Dengue Infection in Adults in the 2017 Outbreak in Vietnam. Biomed Res Int. 2019;2019;3085827.
- 8. Cariappa MP, Bansal AS, Dutt M, Reddy KP. Dengue in the deserts: Search and Destroy Operations. Medical J Armed Forces India. 2015;71:76-78.

Cite this article as: Minhas S, Pardal MPS. Dengue fever: a re-emerging disease. Int J Community Med Public Health 2020;7:1872-4.