

Serositis as a Presenting Feature of Dengue Fever in a Young Female: Forecast of Upcoming Dengue Shock Syndrome

RUCHITA KABRA¹, DHARUV TALWAR², SUNIL KUMAR³, SOURYA ACHARYA⁴, PRARAJ JAISWAL⁵

ABSTRACT

Dengue fever is a prominent challenge in the developing countries throughout the world, with dengue shock syndrome as a leading cause of morbidity and mortality during the seasonal dengue epidemics. Most common presenting features of dengue fever are high grade fever with chills, headache, rash, nausea and vomiting. With the increasing challenges of treating dengue shock syndrome to prevent mortality in the young, it is important to determine factors which can be used to predict dengue shock syndrome. This report showcases a case of 20-year-old young female who presented with the chief complaint of pedal oedema, pain in abdomen along with breathlessness. Upon investigations it was found to be dengue fever with pleural effusion and ascites. The patient later developed dengue shock syndrome, which was managed successfully with the help of intravenous fluids, inotropic support and platelet transfusion. Hence, this case report highlights the importance of detection of serositis in the form of ascites, pleural effusion and pedal oedema in dengue fever as a tell-tale sign of upcoming dengue shock syndrome and the pathophysiology behind it.

Keywords: Ascites, Pedal oedema, Pleural effusion

CASE REPORT

A 20-year-old female presented to the Outpatient Department (OPD) with the chief complaint of swelling of both lower limbs, pain in abdomen along with breathlessness for two days. There was history of fever for one day (high grade along with chills). There was no history of nausea, vomiting, retro-orbital pain, headache or rash. Patient had no prior co-morbidities like hypertension, diabetes mellitus, tuberculosis or bronchial asthma.

On examination, pulse was 78 beats per minute, regular in rhythm with normal volume and no special character, blood pressure was 120/70 mmHg in right arm supine position, bilateral pedal oedema was present [Table/Fig-1], there was no pallor, icterus, cyanosis or lymphadenopathy. On systemic examination, there was dull note present on percussion in bilateral infrascapular region with diminished air entry in bilateral infrascapular region. Abdomen was soft and tenderness was present in epigastrium, fluid thrill and shifting dullness was present. Heart sounds were normal and patient was conscious and oriented. Patient was admitted in intensive care unit and investigations were carried out.

As patient gave history of fever associated with chills, differential diagnosis of malaria, dengue, scrub typhus, urinary tract infection and acute appendicitis was made and tested accordingly.

On investigating, patient was found to be dengue non structural protein one positive, IgM positive status and other laboratory investigations are mentioned in [Table/Fig-2]. Chest radiograph showed bilateral pleural effusion [Table/Fig-3]. Ultrasonography of abdomen showed ascites [Table/Fig-4]. Diagnostic pleural tapping was done and fluid was sent for investigations which revealed exudative aetiology. The provisional diagnosis of dengue with serositis was made.

CBC	Haemoglobin (g/dL)	WBC counts (per mm ³)	Platelet counts (per mm ³)	Haematocrit
Day 1	12.5	3500	39,000	34.7
Day 3	12	3300	63,000	35.1
Day 6	11.9	3800	1,23,000	36.2

[Table/Fig-2]: Showing laboratory investigations of the case.



[Table/Fig-1]: Showing bilateral pitting pedal oedema.



[Table/Fig-3]: Chest radiograph showing bilateral pleural effusion.



[Table/Fig-4]: Ultrasonography of the patient showing ascites.

As patient was diagnosed with dengue fever, she was managed with platelet transfusion, intravenous fluids and antibiotics. On day two of admission, her blood pressure was 70/50 mmHg, and she was given intravenous fluids followed by inotropic support and started with injection noradrenaline infusion as per requirement and Blood Pressure (BP) was monitored. The final diagnosis was dengue shock syndrome with serositis. She improved clinically during the course of hospital stay and her inotropic support was tapered accordingly, and stopped on day four of admission.

Her platelet count was monitored regularly and started increasing (39,000/dL on admission to 1,23,000/dL on day six). Her pleural effusion, pedal oedema and ascites resolved completely by day 14 of admission and she was discharged in stable condition.

DISCUSSION

Dengue fever is one of the most common arthropod borne illness of viral origin in developing countries like India. It is transmitted by mosquito vector of the genus *Aedes*. Dengue has emerged as a leading problem for healthcare facilities in the recent years with periodic epidemics in the tropical, subtropical and temperate areas. Spectrum of dengue fever can range from benign looking innocent fever to life threatening dengue shock syndrome [1]. A small number of patients who have history of being infected with dengue fever earlier in life with one of the four serotypes of dengue virus (DENV 1,2,3 or 4) have risk of developing endothelial leak on being infected with another serotype [2]. This condition is known as severe dengue or dengue shock syndrome or dengue haemorrhagic fever.

Dengue fever is usually a disease which is self-limiting with a mortality rate of less than one percent when it is diagnosed early and the patient has proper access to healthcare facilities [1]. Severe dengue on the other hand has a mortality rate of two to five percent but when it is left untreated the mortality may rise to an alarming 20%. Classically, dengue presents with symptoms such as fever, headache, pain in the retro-orbital area, severe myalgia, arthralgia especially of the knee and the shoulder joint, nausea, vomiting, maculopapular or macular rash predominantly over the face, thorax and flexor surfaces with islands present of skin sparing. In severe dengue, however, signs of endothelial leakage can be seen such as bleeding from sites of minor trauma, signs of gastrointestinal bleed as well as haematuria [3].

Patients may also present with severe pain in abdomen, persistent vomiting which may be accompanied with haematemesis, bleeding from sites of trauma, gastrointestinal bleeding and haematuria [4-7]. Presenting symptoms of severe dengue may also include severe pain in abdomen, persistent vomiting and haematemesis [8]. The next 24 hours after these signs of development of endothelial leakage are seen are crucial and if left untreated the patient may develop shock and present with tachypnoea, tachycardia, pallor, dizziness and decreased level of consciousness [9]. It is therefore

important to predict the development of dengue shock syndrome to prevent mortality and morbidity associated with dengue fever.

Dengue shock syndrome is usually indicated by persistent pain abdomen, vomiting and restlessness [10]. Patient presents usually with features suggestive of circulatory collapse such as pallor, tachypnea and tachycardia. Most critical feature of dengue fever remains leakage of plasma. This leakage of plasma is caused by increased endothelial permeability of capillary. This may present as ascites, pleural effusion, pedal oedema and haemoconcentration [11].

In this patient, breathlessness in dengue fever can be due to pleural effusion, acute respiratory distress syndrome, pneumonia and also shock. This differential diagnosis was ruled out by the means of physical examination showing dull note on percussion with diminished air entry which was confirmed by presence of pleural effusion on chest X-ray. Arterial blood gas was also normal with no evidence of acidosis or acute respiratory distress. In a study, conducted in Pakistan, it was established that pleural effusion in cases of dengue fever is usually exudative and is self-resolving [12]. A similar approach was followed in this case and the pleural fluid study was suggestive of exudative aetiology which resolved without the need of therapeutic thoracentesis. As this patient had pain in abdomen, ultrasonography of the abdomen was done which revealed ascites. A differential diagnosis for this patient was pancreatic ascites, dengue ascites, renal ascites and cardiac ascites. Pancreatic ascites was ruled out by normal serum amylase and serum lipase levels whereas renal ascites was ruled out by normal serum creatinine and urea levels with a normal renal echotexture on ultrasonography. Cardiac causes of ascites were ruled out through a normal electrocardiography with a normal echocardiography. This leads to the diagnosis of dengue leading to ascites with a positive nonstructural antigen test. Development of this acute ascites in a case of dengue fever is usually considered as an ominous sign and more commonly seems to be associated with severe dengue fever. It also denoted more chances of mortality in dengue fever. Pedal oedema in this case was another sign indicative of plasma leakage.

In a study conducted by Jisamerin J et al., it was found that patients with severe dengue developed serositis and a total of 15.3% patients with dengue had polyserositis, while a total of 31% of patients with severe dengue had serositis with a significant difference observed between severe dengue and dengue with or without warning signs [13]. This was also seen in the present case where serositis was linked with dengue shock syndrome.

Atypical presentations of dengue fever have been reported before however, we report a case of serositis as a sign of impending dengue shock syndrome which shall be essential for the clinicians to detect dengue shock syndrome at the earliest [14-16].

CONCLUSION(S)

In the above scenario, it can be postulated that serositis in the patient was due to dengue fever leading to increase in endothelial permeability and plasma leakage. Serositis is a predictor of impending dengue shock syndrome and was treated successfully with fluid replacement therapy judiciously. As the dengue shock syndrome was treated, serositis resolved itself and disappeared on its own. This emphasises that serositis in dengue fever does not need any specific treatment, however, a patient presenting with serositis needs special attention as serositis might be a warning of upcoming deterioration in the form of dengue shock syndrome. It can be concluded that serositis may be an atypical presentation of dengue fever which should not be ignored. Detection of serositis in the form of pleural effusion, ascites or pedal oedema can be a tell-tale sign used to predict dengue shock syndrome in an otherwise benign looking dengue fever.

REFERENCES

- [1] Kalayanarooj S. Clinical manifestations and management of dengue/DHF/DSS. *Trop Med Health*. 2011;39(4):83-87.
- [2] Joob B, Wiwanitkit V. Acute ascites as a clinical manifestation of dengue: A case report. *J Acute Dis*. 2020;9:270-71.
- [3] Suwanto S, Nainggolan L, Sinto R, Effendi B, Ibrahim E, Suryamin M, et al. Dengue score: A proposed diagnostic predictor for pleural effusion and/or ascites in adults with dengue infection. *BMC Infect Dis*. 2016;16:322.
- [4] Kumar M, Karthikeyan A, Karthikeyan VS. Dengue shock syndrome after percutaneous nephrolithotomy leading to hematuria and renal failure: A rare complication. *Indian J Urol*. 2020;36(2):136-37. Doi: 10.4103/iju.IJU_335_19.
- [5] Zhang H, Zhou YP, Peng HJ, Zhang XH, Zhou FY, Liu ZH, et al. Predictive symptoms and signs of severe dengue disease for patients with dengue fever: A meta-analysis. *Biomed Res Int*. 2014;2014:359308. Doi: 10.1155/2014/359308.
- [6] Eswarappa M, Reddy SB, John MM, Suryadevara S, Madhyashatha RP. Renal manifestations of dengue viral infection. *Saudi J Kidney Dis Transpl*. 2019;30(2):394-400. Doi: 10.4103/1319-2442.256847.
- [7] Raza MA, Khan MA, Ejaz K, Haider MA, Rasheed F. A case of dengue fever with hemorrhagic manifestations. *Cureus*. 2020;12(6):e8581. Published 2020 Jun 12. Doi: 10.7759/cureus.8581.
- [8] Navarrete-Espinosa J, Gómez-Dantés H, Celis-Quintal JG, Vázquez-Martínez JL. Clinical profile of dengue hemorrhagic fever cases in Mexico. *Salud Publica Mex*. 2005;47(3):193-200. Doi: 10.1590/s0036-36342005000300002.
- [9] Aguilar-Briseño JA, Moser J, Rodenhuis-Zybert IA. Understanding immunopathology of severe dengue: lessons learnt from sepsis. *Curr Opin Virol*. 2020;43:41-49. Doi: 10.1016/j.coviro.2020.07.010.
- [10] Deshwal R, Qureshi MI, Singh R. Clinical and laboratory profile of dengue fever. *J Assoc Physicians India*. 2015;63(12):30-32.
- [11] Wiwanitkit V. Dengue fever: Diagnosis and treatment. *Expert Rev Anti Infect Ther*. 2010;8(7):841-45.
- [12] Shabbir M, Ameen F, Roshan N, Israr M. Nature and clinical course of pleural effusion in dengue fever. *Int J Intern Emerg Med*. 2018;1(1):1006.
- [13] Jisamerin J, Mohamedkalifa A, Gaur A. Dengue: A neglected disease of concern. *Cureus*. 2021;13(10):e18500. Doi: 10.7759/cureus.18500.
- [14] Kumar S, Papalkar P, Sarode R, Acharya S. Cardiac manifestations in dengue. *Ind J Med Spec*. 2019;10(1):30.
- [15] Madaan S, Talwar D, Kumar S, Jaiswal A, Acharya N, Eleti MR. Dengue shock syndrome complicating high risk twin pregnancy during late gestation: Extinguishing fuel added flames. *Journal of Pharmaceutical Research International*. 2021;33(43B):315-19.
- [16] Mahajan S, Annadatha A, Talwar D, Sessa Satya Sagar WV, Varma AR. Snake bite and dengue: A twin tragedy. *Cureus*. 2021;13(10):e19097. Published 2021 Oct 28. Doi: 10.7759/cureus.19097.

PARTICULARS OF CONTRIBUTORS:

1. Junior Resident, Department of Medicine, Jawaharlal Nehru Medical College and Datta Meghe Institute of Medical Science (Deemed to be University), Sawangi Meghe, Wardha, Maharashtra, India.
2. Junior Resident, Department of Medicine, Jawaharlal Nehru Medical College and Datta Meghe Institute of Medical Science (Deemed to be University), Sawangi Meghe, Wardha, Maharashtra, India.
3. Professor, Department of Medicine, Jawaharlal Nehru Medical College and Datta Meghe Institute of Medical Science (Deemed to be University), Sawangi Meghe, Wardha, Maharashtra, India.
4. Professor and Head, Department of Medicine, Jawaharlal Nehru Medical College and Datta Meghe Institute of Medical Science (Deemed to be University), Sawangi Meghe, Wardha, Maharashtra, India.
5. Junior Resident, Department of Medicine, Jawaharlal Nehru Medical College and Datta Meghe Institute of Medical Science (Deemed to be University), Sawangi Meghe, Wardha, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Dhruv Talwar,
Junior Resident, Department of Medicine, JNMC, Sawangi Meghe,
Wardha, Maharashtra, India.
E-mail: dhruv.talwar2395@gmail.com

PLAGIARISM CHECKING METHODS: [Jan H et al.]

- Plagiarism X-checker: Aug 19, 2021
- Manual Googling: Dec 22, 2021
- iThenticate Software: Jan 03, 2022 (3%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Aug 17, 2021**

Date of Peer Review: **Nov 24, 2021**

Date of Acceptance: **Dec 23, 2021**

Date of Publishing: **Jun 01, 2022**