Original Article

Respiratory manifestations of dengue fever from a rural based Medical College Hospital

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Abstract

Background: Dengue fever is commonest arthropod borne disease. Of late it is seen changing the pattern of presentation. **Materials and Methods:** This observational study was done on patients who were admitted to SVS Medical College Hospital during a period of SEPTEMBER 2010 to AUGUST 2014. During these 5 years a total of 224 cases were diagnosed as dengue fever as per the guidelines of WHO. **Observations:** A total of 224 cases were included in this study. 72 patients fall under uncomplicated Dengue Fever (DF); 108 cases were classified under DHF (Dengue hemorrhagic fever) while 44 fall under DSS (Dengue shock syndrome). 16 of 108 DHF group and 22 of DSS group succumbed to the disease. Pleural effusion was commonly seen in most of the complicated and uncomplicated cases. Pneumonia, ARDS (Acute respiratory distress syndrome) was exclusively noted in DHF and DSS cases only; two cases of pulmonary haemorrhage were noted in DHF. **Discussion and Conclusions:** Respiratory manifestations are common in dengue fever. Most common is pleural effusion that was observed in uncomplicated DF (4 of 72), DHF (88 of 108) and DSS (38 of 44). ARDS was not uncommon presentation DHF (16 of 108) and DSS (22 of 44). Pulmonary haemorrhage is very rare.
Keywords: Dengue fever, Dengue hemorrhagic fever, Dengue shock syndrome, Respiratory manifestations, ARDS, Pulmonary haemorrhage.

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Received Date: 21/10/2016 Revised Date: 10/11/2016 Accepted Date: 14/12/2016

Access this article online

Quick Response Code:

Website: www.statperson.com

DOI: 02 January 2017

INTRODUCTION

Dengue fever (DF) is the commonest of mosquito borne infections afflicting the mankind which is on the rise in incidence, a change in clinical presentation to severe form of the disease[1,2,3,4,5,6]. Dengue fever is changing in presentation towards atypical and severe forms with a high mortality rate of about 20%[5, 6 and 7].

MATERIALS AND METHODS

This observational study was done on patients who were admitted to SVS Medical College Hospital during a period of September 2010 to August 2014. During these 5 years a total of 224 cases were diagnosed as dengue fever as per the guidelines of WHO[4].

Table 1: WHO classification of dengue fever(http://www.who.int/csr/resources/publications/en/)[4]

DHF/DF	GRADE	DIAGNOSIS	LABORATORY
DF		Fever with two or more of following: Headache Retro orbital pain MyalgiasArthralgias	Leucopenia, occasionally thrombocytopenia may be present. No e⁄o plasma loss
DHF	I	Above signs plus positive tourniquet sign	Thrombocytopenia < 100 000; Hct rise ‡ 20%
DHF	II	Above signs plus spontaneous bleeding	Thrombocytopenia < 100 000; Hct rise ‡ 20%
DHF	III	Above signs plus circulatory failure (weak pulse, hypotension, restlessness)	Thrombocytopenia < 100 000; Hct rise ‡ 20%
DHF	IV	Profound shock with undetectable BP and pulse	Thrombocytopenia < 100 000; Hct rise ‡ 20%

DHF, dengue haemorrhagic fever; DF, dengue fever; DSS, dengue shock syndrome. *DHF III and IV also called as DSS.

How to cite this article: Venkateshwarlu Nandyala, Krishna Prasad T, Gandiah P, Anand G Reddy. Respiratory manifestations of dengue fever from a rural based Medical College Hospital. *International Journal of Recent Trends in Science and Technology.* January 2017; 21(3): 210-213. http://www.statperson.com (accessed 04 January 2017).

OBSERVATIONS

A total of 224 cases were included in this study. 72 patients fall under uncomplicated Dengue Fever (DF); 108 cases were classified under DHF (Dengue hemorrhagic fever) while 44 fall under DSS (Dengue shock syndrome). 16 of 108 DHF group and 22 of DSS group succumbed to the disease.

Table 2: Clinical presentations of dengue fever among the studied cases

Clinical presentation	Total number	Percentage	Expired number	Percentage	"p" value
Dengue fever	72	32.14	0	0	< 0.001
Dengue hemorrhagic fever	108	48.21	16	7.142	< 0.001
Dengue shock syndrome	44	19.64	28	12.5	< 0.001
Total	**224**	**100**	**44**	**19.642**	**< 0.001**

Twenty-four cases with co-morbid conditions like diabetes, hypertension, chronic obstructive pulmonary disease and chronic liver and renal failure were excluded from the study. There was no significant difference between the cases with or without any associated co-morbid conditions with the type and complications of dengue feverin this observational study.

Table 3: Showing associated Co-morbid conditions

Co-morbid condition	Uncomplicated dengue fever [72]	Dengue hemorrhagic fever [108]	Dengue shock syndrome [44]	'p' value
Diabetes mellitus	4	5	8	0.258
Hypertension	0	2	4	0.128
Coronary heart disease	0	6	2	0.056
Chronic obstructive airways disease	2	6	2	0.086
Chronic renal disease	1	2	2	0.328
Cirrhosis of liver	0	2	2	0.052

Pleural effusion was commonly seen in most of the complicated and uncomplicated cases. Pneumonia, ARDS (Acute respiratory distress syndrome) was exclusively noted in DHF and DSS cases only; two cases of pulmonary haemorrhage were noted in DHF.

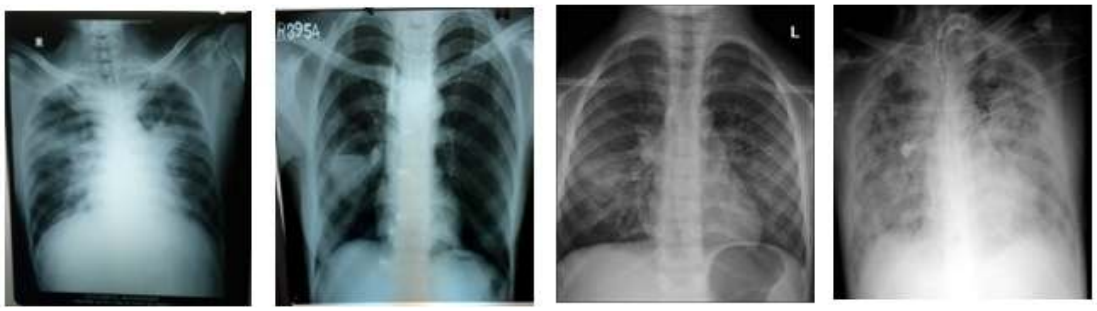

Figure 1: X ray showing bilateral hilar congestion in a case of DSS case with ARDS
Figure 2: X ray showing pneumonia on the right lung in a patient with DHF
Figure 3: X ray bilateral hilar infiltrations in DSS case
Figure 4: X ray showing extensive bilateral opacities in an ARDS case of DSS group

Table 4: Showing various respiratory manifestations in the present study

Respiratory disease	Uncomplicated dengue fever [72]	Dengue hemorrhagic fever [108]	Dengue shock syndrome [44]	'p' value
Pleural effusion	4$	88$	38$	0.05
Pneumonia unilateral	0	12	14	0.05
Pneumonia bilateral	0	16	12[2*****]	0.05
ARDS	0	16[8***]	22[10**]	0.05
Pulmonary hemorrhage	0	2*	0	0.264

Note: 22 patients of died during the course of treatment of these two* patients pulmonary haemorrhage, 10** cases belong to DSS, 8*** patients of DHF who had ARDS and two**** patients of bilateral pneumonia belonging to DSS group. $ Pleural effusion especially bilateral is the most common sign detected by ultrasonography which is seen most of the dengue cases who recovered well with simple supportive therapy. The cases that fall under acute respiratory failure were grouped in group I [78 in all that include 8 patients of DSS and 2 cases of DHF] and the rest of the cases were included in group II.

Table 5: Showing the symptomatology

Parameter	Group I [78]	Group II [146]	'p' value
Fever	77	146	0.46
Retro-orbital headache	70	140	0.58
Body ache	66	138	0.158
Abdominal pain	52	88	0.05*
Nausea and vomiting	48	64	0.05*
Petechiae/ Echymosis	36	66	0.12
Gum bleeding	9	21	0.22
Epistaxis	8	19	0.18
Subconjunctival hemorrhage	16	28	0.115
Melena	8	10	0.05*
Cerebral hemorrhage	-	2	0.05*
Menorrhagia	2	2	0.18
Cough	46	42	0.05*
Dyspnea	44	32	0.001*
Altered consciousness	16	30	0.14
Hypotension	60	24	0.001*

The symptomatology did differ slightly. Abdominal pain nausea and vomiting, melena, dyspnea altered sensorium and hypotension were significantly in more frequency as comparatively in the acute respiratory inefficiency group.

Table 6: Showing the differences in laboratory reports between the two groups

Lab report	Group I [78]	Group II [146]	'p' value
Hemoglobin (mean) G/dL (range)	7.824 (5.4 – 11.2)	9.44 (6.68 – 12.4)	0.05*
Total leucocyte count (mean) /cu mm.	6,244 (4,034 – 12,844)	4,408 (3000 – 7,800)	0.05*
Platelet count(mean) / cu mm	56,482 (10,000 – 124000)	82,628 (10,000 – 240.000)	0.05*
AST (aspartate aminotransferase) IU/ml (mean)	126.44 (54 – 308)	61.24 (38 – 284)	0.001*
ALT (alanine aminotransferase) IU/ml (mean)	108.55 (48 – 406)	58.38 (42 – 208)	0.001*
Blood urea mg/ dL(mean)	56.42 (38 – 128)	42.86 (26 – 86)	0.05*
Serum creatinine	3.02 (2.8 – 5.6)	1.64 (1.0 – 3.1)	0.05*
Serum bilirubin mg/ dL (mean)	2.88 (0.98 – 4.12)	1.68 (0.89 – 2.64)	0.145
Serum albumin G/ dL	2.86 (2.06 – 3.28)	3.66 (2.16 – 4.26)	0.001*

The laboratory findings showed a statistically significant differences in the two groups. Of these transaminases and serum albumin were highly significant. Haemoglobin levels were levels lower in respiratory group as also the platelet counts while the leucocyte levels were slightly more as compared to group II cases.

DISCUSSION

The present study showed pleural effusion as most common presentation.Pneumoniaeither unilateral or bilateral was present 28 of DHF and 26 cases of DSS while none in uncomplicated DF had pneumonia. Only 2 DHF patients had pulmonary haemorrhage. Pleural effusion, ascites can be consistent with increased vascular permeability, plasma leakage, abnormalities of homeostasis and protein losing shock syndrome which commonly occur in the pathogenesis[8]. The endothelium is the target of the immune-pathological mechanisms in dengue and DHF. The hallmark is vascular permeability and coagulation disorders. These mechanisms can explain varied systemic involvement[4,5]. Dyspnea is a very significant and most prominent symptom abdominal pain associated with nausea and vomiting associated with an increased prevalence to ARDS. The similar observation was observed by earlier studies[6,7,9-13]. Dengue haemorrhagic fever can result in acute respiratory distress syndrome (ARDS)[6,9-14]. Dengue virus antigen is found in alveolar lining cells of the lung. Increased permeability of the alveolar-capillary membrane results in oedema in the alveoli and interstitial spaces which leads to pulmonary dysfunction[7]. Dengue shock syndrome is reported to be the third leading cause of ARDS in dengue endemic area [Goh *et al*]. Pulmonary haemorrhage with or without haemoptysis, though rare has also been reported in DHF[15-18] Dengue infection affects organs like liver, heart, lungs, skin[19]. This may be due to an increase in the vascular permeabilty[20].

SUMMARY AND CONCLUSIONS

Respiratory manifestations are common in dengue fever. Most common is pleural effusion that was observed in uncomplicated DF (4 of 72), DHF (88 of 108) and DSS (38 of 44). ARDS was not uncommon presentation DHF (16 of 108) and DSS (22 of 44). High incidence in ARDS cases can be attributed to the fact this hospital is the only

centre with mechanical ventilation support in this region of Telangana. Associated co-morbid conditions did not make much change in final outcome of the dengue fever. Pulmonary haemorrhage is relatively a rare phenomenon in this study and also in the literature. The authors recommend medical fraternity to be aware of various atypical manifestations of dengue fever.

REFERENCES

1. World Health Organization, WHO report on global surveillance of epidemic-prone infectious diseases? <http://www.int/emc.documents/surveillance/docs/whocdsesrisr2001.htm>, 2001.
2. Weekly Epidemiological Record, No. 36, 8th February 2002, pp. 41–43.
3. Weekly Epidemiological Record, No. 36, 6th September 2002, pp. 300–302.
4. WHO Dengue Hemorrhagic fever, early recognition, diagnosis and hospital management, WHO/CDS/EPR/2006 4a, Geneva, Switzerland, 2006.
5. WHO classification of dengue fever (http://www.who.int/csr/resources/publications/en/)
6. Mohammad NA, El-Raoof EA, Ibrahim HA; Respiratory manifestations of dengue fever in Taiz-Yemen; Egyptian J of Chest diseases and Tuberculosis (2013) 62, 319-323
7. Gulati S and Maheshwari A (2007): Atypical manifestations of dengue; Tropical Medicine & International Health 12 (9) (2007) 1087 – 1095.
8. Venkata Sai, Krishnan RS, Role of ultrasound in dengue fever, British Journal of Radiology 78: (929) (2005): 416–418.
9. Lum LCS, Thong MK, Cheah YK, et al, Dengue associated adult respiratory distress syndrome, Annals of Tropical Paediatrics 15 (1995) 335–339.
10. Thong MK. (1998) Dengue Shock Syndrome and acute respiratory distress syndrome. Lancet 352, 1712.
11. Sen MK, Ojha UC, Chakrabarti S, et al, Dengue hemorrhagic fever (DHF) presenting with ARDS, Indian Journal of Chest Diseases and Allied Sciences 41 (1999) 115–119.
12. Wang CC, Liu SF, Liao SC, Lee IK, Liu JW, Lin AS, Wu CC, Chung YH, and Lin MC; Acute Respiratory Failure in Adult Patients with Dengue Virus Infection: Am. J. Trop. Med. Hyg., 77(1), 2007, pp. 151–158
13. Devarajan TV, Prashant PS, Mani AK, Victor SM, Khan PS; Dengue with ARDS. JIACM 2008; 9(2): 146-9
14. Gogna A, Pathak S, Dhamija K, Jharyan P, Arora BA; Changing clinical profile of dengue fever in Delhi in 2011: Journal, Indian Academy of Clinical Medicine z Vol. 16 (1) 21-24.
15. Liam CK, Yap BH & Lam SK. (1993) Dengue fever complicated by pulmonary hemorrhage manifesting as hemoptysis. Journal of Tropical Medicine and Hygiene 96, 197–200.
16. Setlik RF, Ouellette D, Morgan J, et al, Pulmonary hemorrhage syndrome associated with an autochthonous case of dengue hemorrhagic fever, Southern Medical Journal 97 (2004) 688–691.
17. Sharma SK, Gupta BS, Devpura G, Pulmonary hemorrhage syndrome associated with dengue hemorrhagic fever, Journal of the Association of Physicians of India 55 (2007) 729–730.
18. Marchiori E, Ferreia JLN, Bittercourt CN, Neto CADA, Zanetti G, Mano CM, Santos AASD and Vianna AD; Pulmonary haemorrhage syndrome associated with Dengue fever, High resolution computed tomography findings; a case reports. Orphanat J rare diseases 2009 4:8
19. Dalrymple, N. A., and Mackow, E. R. (2012). Roles for endothelial cells in dengue virus infection. AdvVirol. 2012, 840654. doi: 10.1155/2012/840654
20. Isea-Dubuc JO, Vargas C and Suarez JA (2008) Pleuro-pulmonary complications in dengue hemorrhagic fever CHEST 134 – 4.

Source of Support: None Declared
Conflict of Interest: None Declared