Section: Paediatrics

Research

CLINICO-HAEMATOLOGICAL PROFILE AND OUTCOME OF DENGUE FEVER IN PAEDIATRIC AGE GROUP OF ORISSA – RETROSPECTIVE STUDY

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Received : 12/09/2022
Received in revised form : 05/10/2022
Accepted : 16/10/2022

Keywords:
Dengue serology, Elisa, Total plate let count, Haemocrit, Orissa.

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DOI: 10.47009/jamp.2022.4.5.43

Source of Support: Nil,
Conflict of Interest: Nonedeclared

Int J Acad Med Pharm
2022; 4 (5); 204-208

Abstract

Background: Dengue is a mosquito borne viral disease rapidly spread in many countries of the world. Shock in dengue usually results from continued plasma leaking on 4-5th day of illness. If the patient is undiagnosed and un-treated promptly. **Materials and Methods:**80 paediatric patients age between 1 month to 14 years having positive dengue, Serology (NS1/1 gm) by elisa were studied Blood examination included CBC, TPC, PS, ICT for malaria. Dengue serology, Elisa NS1 (within 5 days), Elisa Igm and IgG (After 5 days of illness). SGOT, SGPT, Blood Urea, Serum creatinine, sick ling test were carried out. **Result:** Clinical manifestation like vomiting, myalgia, joint pain, Abdominal pain facial puffiness, convulsion had significant p value results ($p<0.001$). Bleeding manifestation like petechiae, purpura and sub-conjunctival haemorrhage and GI bleeding were highly significant. Hepatomegaly, pallor, Icterus, Tachypnea plural effusion, splenomegaly had significant p value. Comparison between haematoctrit with severity of dengue had significant p value. Platelet count < 50,000 were in 16 (20%) case and 4,50,000 in 6 (7.5%) patients. **Conclusion:** Present pragmatic study of clinico-haemotological profile reveals the various diagnostic value of dengue fever. This study will certainly help the paediatrician to treat such patients efficiently to avoid morbidity and mortality of patients.

INTRODUCTION

Dengue fever recorded first in chinaencyclopaedia in the Jin dynasty (265-40 AD) which was referred to as "water poison" associated with flying insects, the word originated from Swahili phrase "Ka-dinga pepo" meaning cramp like seizure caused by an evil spirit.[1] Dengue is a mosquito borne viral disease that has rapidly spread globally. Dengue virus mainly transmitted by female Aedesaegypti mosquitoes. Dengue is wide spread throughout the topics with local variations in risk influenced by rainfall, temperature relative humidity and unplanned rapid urbanisation.[2] As per WHO reports deaths due to Dengue were 960 to 4032 between 2000 to 2015.[3]

Most of the dengue infecting are mild in nature and can cause flue like illness, while some may progress to potentially lethal complications called severe dengue. It has high degree of fever, severe mayalgia, arthalgia, headache, vomiting abdominal pain, and fatigabity. Increased heamatocrit with thrombocytopenia and leucopoenia with relative lymphocytosis are the common laboratory markers of dengue.[4] Early detection of disease and access to proper medical care and management following the protocols lower the fatality of severe dengue cases.

It is matter of clinical challenge that still there is no proper medication. Hence attempt is made to evaluate the clinico-heamatocrit profile, if any variations in present parameters may help us, to predict the proper medication to treat such patients efficiently moreover the present study can be a guide line to paediatricians to treat such patients.

MATERIALS AND METHODS

80 paediatric dengue patients aged between 1 month to 14 years were admitted at MKCG Medical College hospital paediatric o/p Berhampur Odisha

ISSN (O): 2687-5365; ISSN (P): 2753-6556

were studied to estimate the outcomes of dengue cases.

Inclusive Criteria

Children aged between 1 month to 14 years with positive dengue serology (NS1/1 gm) by Elisa were selected for study.

Exclusive Criteria

Patients diagnosed other than Dengue like malaria, typhoid. Urinary tract infections, scrub typhus, Tuberculosis, hepatitis, were excluded from study.

Method

Clinical manifestations of every patients with positive dengue serology were noted to confirm the diagnosis Blood, examination included, Hb% Total platelet count CBC, PS study Haematocrit, Random Blood sugar, ICT for malaria, SGOT, SGPT serum bilirubin, chest-x ray CSF (if required). Blood urea and serum bilirubin, chest-x ray CSF creatinine, sickling test, DengueserologySlisa NS1 (within 5 days of Illness) Elisa Igm and / or IgG (after 5 days of illness). Merisa OD < NC ±0.3 was non-reactive > NC ± 0.3 was reactive (cut off value = NC ± 0.3 (NC±= Mean absorbance (OD) of Negative control. Duration of study was June-2019 to May-2021

Statistical Analysis

Various clinical manifestation haemocrit Blood counts, severity of Dengue cases were studied with chi-square test and p value. The statistical analysis was carried out in SPSS software. The ratio of male and female was 2:1.

RESULTS

[Table 1] Clinical manifestation in severe dengue patients 80 (100%) high degree of fever was observed, 38 (47.5%) vomiting, 54 (67%) myalgia, 4 (5%) jaundice, 37 (47%) headache, 6 (7.5%) joint pain, 36 *(45%) abdominal pain, 6 (7.5%) had Facial puffiness. 2 (2.5%) had convulsion, 4 (5%) had altered sensorium, 4 (5%) had diarrhoea.

Vomiting, myalgia, joint pain, facial puffiness, convulsion had highly significant p value (p<0.001).

[Table2] Study of different manifestations with severity of Dengue 24 (30%) had petechiae and purpura, 2 (2.5%) had sub-conjunctival haemorrhage parameters are highly significant p value (p<0.01).

[Table3] Study of different clinical signal severe dengue 26 (32.5%) Blanching rash, 14 (17.5%) pallor, 4 (5%) Icterus, 12 (15%) tachypnea, 2 (2.5%) lymphodenopathy, 12 (15%) had pleural effusion, 6 (7.5%) had hypotension, 10 (12.5%) ascites, 32 (40%) had liver enlargement, 8 (10%) Splenomegaly. The parameters pallor Icterus, Tachypnea, pleural effusion > 2cm, Splenomegaly had significant p values (p<0.001).

Table 1: Clinical Manifestations in severe dengue patients.

Symptoms	Dengue without Warning sign	Dengue with Warning Sign	Severe Dengue	Total %	Percentage (%)	Chi-square	P value
Fever	34	32	14	80	100 %	--	--
Vomiting	12	16	10	38	47.5 %	5.320	0.070
Myalgia	26	24	4	54	67 %	11.73	0.003
Jaundice	0	0	4	4	5 %	19.85	0.001
Headache	18	16	4	38	47 %	2.495	0.287
Joint pain	2	2	2	6	7.5 %	1.13	0.568
Abdominal pain	0	26	10	36	45%	48.75	0.001
Facial puffiness	0	0	6	6	7.5 %	30.57	0.001
Convulsion	0	0	2	2	2.5%	9.670	0.008
Altered sensorium	0	0	4	4	5 %	19.8	0.008
Diarrhoea	0	4	0	4	5 %	6.31	0.043
Retro-orbital pain	0	0	0	0	0 %	--	--

The significant manifestations were vomiting myalgia, joint pain, Abdominal pain, facial puffiness, convulsions (p<0.001).

Table 2: Comparison of Hematocrit value with severity Dengue

Hematocrit	Dengue without warning sign	Dengue with warning sign	Severe Dengue	Total
< 35 %	14	16	10	40 (50%)
35-40 %	16	6	4	26 (32.5%)
> 40 %	4	10	0	14 (17.5%)
Total	34	32	14	80

Chi-square – 12.50, p value – 0.01

More than > 40% were observed in 14 (17.5%) and < 35% in 40 (50%) patients

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Table 3: Study of different cli nical signs of Dengue

Signs	Dengue without warning sign	Dengue with warning sign	Severe Dengue	Total (80)	Percentage	Chi square	p value
Blanching rash	10	12	4	26	32.5 %	0.611	0.737
Pallor	6	2	6	14	17.5 %	9.04	0.001
Icterus	0	0	4	4	5 %	19.8	0.001
Tachypnea	0	0	12	12	15 %	66.5	0.001
Lymphadenopathy	0	2	0	2	2.5 %	3.07	0.215
Pleural Effusion	0	0	12	12	15 %	66.5	0.001
Hypotension	0	0	6	6	17.5 %	30.5	0.001
Ascites	0	4	6	10	12.5 %	16.6	0.001
Liver > 2cm	4	16	12	32	40 %	24.81	0.001
Splenomegaly	0	4	4	8	10 %	9.36	0.001
Meningeal Sign	0	0	0	0	0	--	--

Significant values are pallor, Icterus, Tachypnea, Pleural effusion, hypotension, Ascites, liver enlargement > 2cm, splenomegaly had significant p value (p<0.001).

Table 4: Study of different bleeding Manifestations with severity of Dengue

Symptoms	Dengue without warning sign	Dengue with warning sign	Severe Dengue	Total (N=80)	Percentage (%)	p value
Petechiae	2	14	8	24	30 %	0.001
Ecchypmosis	0	0	0	0	0 %	--
Gum Bleeding	0	0	0	0	0 %	--
Sub conjunctival Haemorrhage	0	0	2	2	2.5 %	0.001
GI Bleeding	0	0	4	4	5 %	0.001
Epistaxis	0	0	0	0	0	--

Significant values are petechiae and purpura, sub-conjuctival haemorrhage and GI bleeding (p<0.001)

Table 5: Study of platelet count and different dengue

Total platelet cant (count/mm2)	Dengue without warning sign	Dengue with warning sign	Severe sign	Total
< 50,000	0 (0%)	12 (37.5%)	4 (28.5%)	16 (20%)
50,000-100000	2 (5.8%)	12 (37.5%)	4 (28.5%)	18 (22.5%)
100001-450000	26 (76.5%)	8 (25%)	6 (34%)	40 (50%)
>4,00,000	6 (17.7%)	0	0	6 (7.5%)
Total	34	32	14	80

Chi-square – 36.84 p<0.001

Platelet count < 50,000 were in 16 (20%) and highest platelet count > 4,50,000 were observed 6 (7.5%) patients.

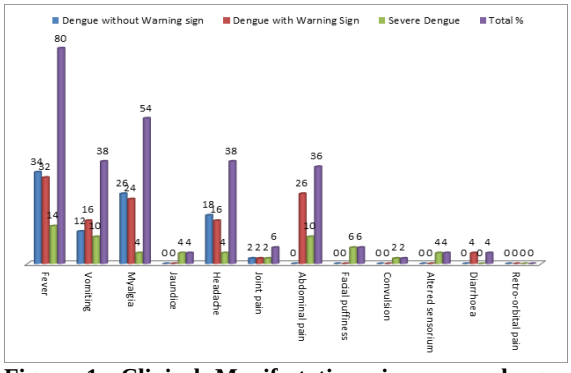

Figure 1: Clinical Manifestations in severe dengue patients

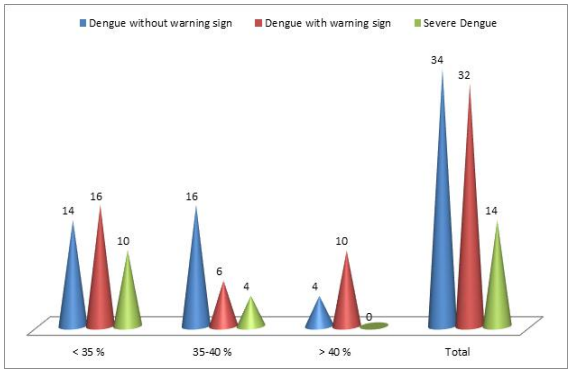

Figure 2: Comparison of Hematocrit value with severity Dengue

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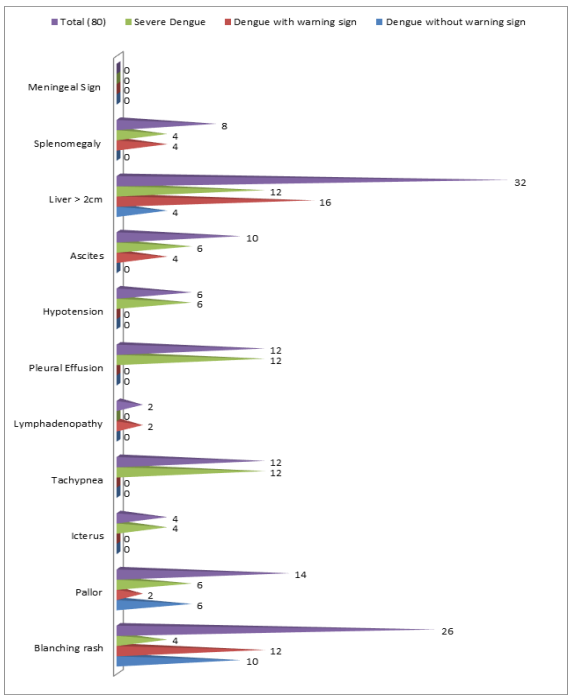

Figure 3: Study of different clinical signs of Dengue

[Table4] Comparison of haematocrit parameters with severity of Dengue fever 40 (50%) had <35% haematocratic value 26 (32.5%) had 35-40% haematocratic value 14 (17.5%) had > 40% haematocratic value.

[Table5] Study of platelet count in dengue – 16 (20%) had < 50000 Total platelet count (count/mm2), 18 (22.5%) had 50,000 to 1,00,000 Total platelet count (TPC), 40 (50%) had 100000-450000 TPC, 6 (7.5%) had >4,50,000 TPC and p value was highly significant.

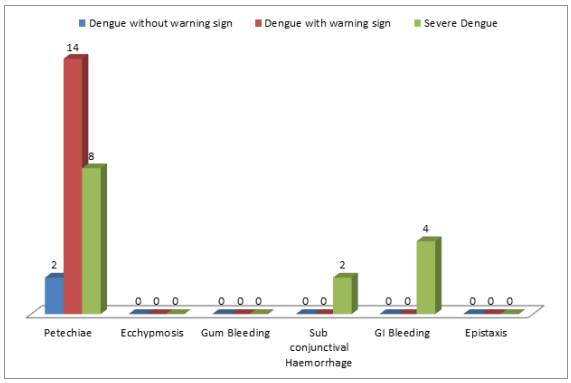

Figure 4: Study of different bleeding Manifestations with severity of Dengue

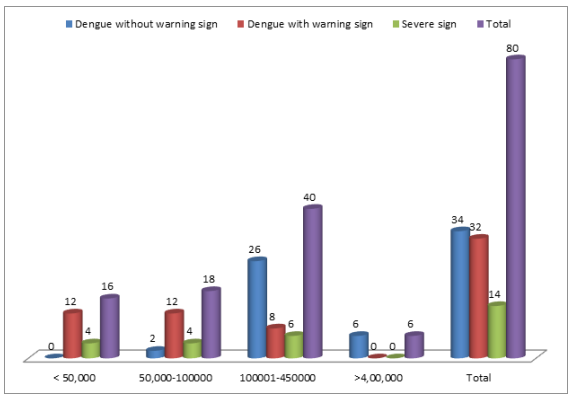

Figure 5: Study of platelet count and different dengue

DISCUSSION

Present clinic-haematological profile and outcome of Dengue in paediatric age group of Orissa. In clinical manifestation of severe dengue cases vomiting myalgia joint pain, abdominal pain, facial puffiness, convulsions had highly significant p value (p<0.001) [Table1]. Study of different bleeding manifestation with severity of dengue, petechiae and purpura sub-conjuctival haemorrhage and GI bleeding had highly significant p value [Table2]. In the study of different clinical signs – 26 (32.5%) had Blanching rush, 14 (17.5%) had pallor, 4 (5%) had Icterus, 12 (15%) had tachyprea, 2 (2.5%) lymphadenopathy, 12 (15%) had pleural effusion, 6 (7.5%) had hypotension, 10 (12.5%) had ascites, 32 (40%) had enlargement of liver >2 cm, 8 (10%) had splenomegaly out of these findings, pallor, Icterus, Tachypnea, Pleural effusion, hypotension, ascites, enlargement of liver > 2cm, splenomegaly had significant p value (p<0.001) [Table3]. In the comparison of haematocrit values with severity of dengue cases 410 (50%) were < 35% of haematocrit, 26 (32.9%) were between 35-40%, 14 (17.54%) had >40% haematocrit value and p value was highly significant [Table4]. Study of platelet count in severe dengue cases 16 (20%) had <50,000 Total platelet count, 18 (22.5%) had 50000-100000 TPC, 40 (50%) cases had 100001-450000 TPC, 6 (7.5%) cases had > 450000 and p value was highly significant (p<0.001) [Table5]. These findings are more or less in agreement with previous studies.[5,6,7]

Dengue mosquitoes are Aedesaegypt eggs can survive for longer period, as they are capable of withstanding desiccation. It can breed in drums, jars, pots, buckets, flower vases, plant saucers tanks, bottles, tins, tyres, cement blocks, bamboo, stumps, coconut shells, tree holes and many more places where rain water is collected or stored.[8]

Dengue infection were classified on symptomatic basis – (1) undifferentiated fever, (2) Dengue fever (DF), Dengue haemorrhage fever (DHF), Again DHF was classified in DHF-I Thrombocytopenia Haemo concentration + Tourniquet test (TT1) positive + Absence of spontaneous bleeding

DHF-II – Thrombocytopenia + Haemocon spontaneous bleeding

ISSN (O): 2687-5365; ISSN (P): 2753-6556

DHF-III – Thrombocytopenia + Haemoconcentration + positive TT+ circulator insufficiency (Feeble pulse, drop of 20 mm Hg or greater in arterial BP, cold extremities and apprehension

DHF-IV – Thrombocytopenia + haemoconcentration + positive TT+ Imperceptible pulse and BP. Dengue virus infected monocytes, B-lymphocytes and mast cells produce different cytokines. It has been suggested that, Th1 cytokines responses are seen during the first three days of illness where Th2 cytokines responses occur in later stages.[9] These cytokines are found to be the cause of increased vascular permeability and shock during infections,[10] retard the platelet function and thus contribute to platelet defects associated with dengue infection with decreased number of CD-4+ T cells,[11] Lowest levels of these cells are seen during subsidence of fever or on the day of development of shock. Bone marrow depression is also seen in dengue infection which can cause absolute lymphopenia.[12] Genetically the children with HLA-24 chromosomes are more likely to develop Dengue haemorrhagic fever and develop Dengue haemorrhage fever (DHF).

Progressive leucopoenia followed by rapid decrease in platelet count usually precedes plasma leakage. An increasing haemotocrit above base line may be one of the earliest additional signs.[13] Abnormal haemostatic and leakage of plasma in this phase leads to shock, bleeding, accumulation of fluid in pleural and abdominal cavity.

CONCLUSION

Most of the cases of dengue were studied during rainy season and winter season and maximum cases in the month of November. Most common symptoms were high degree of fever, myalgia, headache abdominal pain, facial puffiness, joint pain, jaundice, altered sensorium diarrhoea and convulsion. In severe cases bleeding manifestation were petechiae and purpura, GI bleeding, enlargement of liver, splenomegaly, hypotension. TT test positive Elisa NS1 followed by Igm Elisa was confirmative laboratory findings.

Early diagnoses and proper management strict monitoring can prevent the morbidity and mortality of dengue fever because proper medication for Dengue is yet to be known.

Limitation on Study

Owing to the tertiary location of studied hospital small number of patients and lack of latest technologies we have limited results.

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ISSN (O): 2687-5365; ISSN (P): 2753-6556