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Clinical Profile of the Dengue Infection in Children

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Abstract: *Aim of the present study is to know the various predominant clinical manifestations of dengue fever in a tertiary care center, this is a Prospective observational study conducted from January 2017 to December 2017 on patients with dengue fever attended to OPD / admitted in the Department of Paediatrics, Government General Hospital, Siddhartha Medical College, Vijayawada, AP. A total number of 100 cases were included in the study with children below 12 years of age who are serologically dengue positive (NS1 & IgM) after exclusion criteria. Standard protocol treatment followed and the cases were followed up daily for the clinical parameters and blood parameters till improvement seen clinically and haematologically. The frequency of various signs and symptoms were compared between the non severe dengue (NSD) and severe dengue fever (SDF). 51% of the children were between 5-9 years of age. The mean age is 6.87 years for NSD and 6.3 years for SDF. Fever (100%), pain abdomen (74%), vomiting (70%), rash (68%) and headache (52%) were the most common symptoms. Vomiting, pain abdomen and headache being more commonly seen in children with SDF. Hepatomegaly (95%), petechiae (61%), splenomegaly (46%) and edema (34%) were among the most common signs in both NSD and SDF. Petechiae and splenomegaly were more common in children with severe dengue.*

Keywords: *Fever, abdominal pain, hepatomegaly, non severe dengue and severe dengue.*

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I. Introduction

Dengue is the most common mosquito borne, endemo-epidemic arboviral infection in many tropical and subtropical regions of the world. Globally 50 million dengue infections are reported annually[1]. The first dengue fever in India was reported during 1956 from Vellore and the first dengue haemorrhagic fever occurred in Calcutta in 1963. In India the annual incidence estimated to be 7.5 to 12.5 million by 1975, become a leading cause of hospitalization and death among children in many districts of Odisha, a state of Eastern India. The first outbreak was reported in 2010, followed by extensive outbreaks in 2011, affecting a large number of people. According to the WHO the case fatality rate for dengue is roughly 5%. *Aedes albopictus* was found to be the most abundant vector in the areas surveyed, followed by *Aedes aegypti*. DENV-2 is the prevailing serotype. The case fatality rate in severe dengue infection which consists of dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS) can be as high as 44%. If intervention occurs early, mortality can be reduced to less than 1%. Unusual clinical manifestations of dengue fever have become more common in the last few years. Although liver is not a major target organ, hepatic dysfunction is a well-recognized feature, often characterized by acute hepatitis, with pain in the right hypochondrium, hepatomegaly, jaundice and raised aminotransferase levels [2,3].

II. Methodology

This study is a hospital based Prospective observational study conducted from January 2017 to December 2017 on patients with dengue fever attending to OPD / admitted in the Department of Paediatrics, Government General Hospital, Siddhartha Medical College, Vijayawada, AP. Institutional ethics committee permission is taken to conduct this study. A total number of 100 cases were selected following the inclusion criteria of all children below 12 years of age who are serologically dengue positive (NS1 & IgM) and exclusion criteria includes children with concomitant infections such as Malaria, Typhoid, Hepatitis A & B, patients age more than 12 years and patient parents who refused to give consent for the study. Standard protocol treatment is followed and cases were followed up daily for the clinical parameters and blood parameters till the improvement seen clinically and haematologically. Daily monitoring of vitals, tourniquet test, chest x-ray, ultrasonography and liver function tests were done for all the patients. The patients were treated with oral paracetamol, intravenous fluids, blood products, and inotropes as per the recent WHO dengue guidelines. The frequency of various signs and symptoms were compared between the non severe dengue (NSD) and severe dengue fever (SDF). The results were tabulated, correlated and the outcomes were recorded.

III. Results

The total numbers of cases were 100, out of which 48 were cases of non severe dengue (NSD) which includes undifferentiated fever, dengue fever without and with warning signs and 52 were cases of severe dengue fever (SDF) which includes dengue hemorrhagic fever and dengue shock syndrome according to WHO guidelines[4]. There were 48% males and 52% females in our study. The male to female ratio was 0.9: 1. The mean age of presentation of children with NSD and SDF in the present study is 6.87 and 6.3 years respectively.

The majority of the cases were admitted in the rainy and winter season between the months of July and November. The peak of admission is seen in the month of September with 39 cases. The least admissions are in the summer season, specifically in the month of April. Fever is present in100% of cases in NSD and SDF. Pain abdomen is more common in children with SDF as compared to NSD ($p<0.05$, significant). Pain abdomen is seen in 74% of cases. Vomiting is seen in 70% of the cases and is significantly more common in children with SDF as compared to NSD ($p<0.05$, significant). Headache is seen in 52% of cases which is more common in children with SDF compared to NSD and is statistically significant ($p<0.05$). Rash is seen in 68% of the cases. Arthralgia and Melena were relatively less common with 20% and 15% of the cases respectively.

Hepatomegaly is seen in 95% of cases. It`s relatively more in SDF compared to NSD and the difference is not of statistical significance (91.7% of NSD, 44/48 v/s 98.1% of SDF, 51/52; $p>0.05$). The hepatic involvement may be due to direct infection of the dengue virus or due to immune mediated hepatocyte injury[2,3]. Splenomegaly is seen in 46% of cases, more common in children with SDF (59.6%) compared to NSD (31.3%) group with ($p<0.05$, significant). Petechiae and edema are seen in 61% and 34% of the cases respectively in the present study.

Table 1. Symptoms of dengue infection in children

Symptoms	Total cases (n=100)
Fever	100%
Pain abdomen	74%
Vomiting	70%
Rash	68%
Headache	52%
Arthralgia	20%
Melena	15%

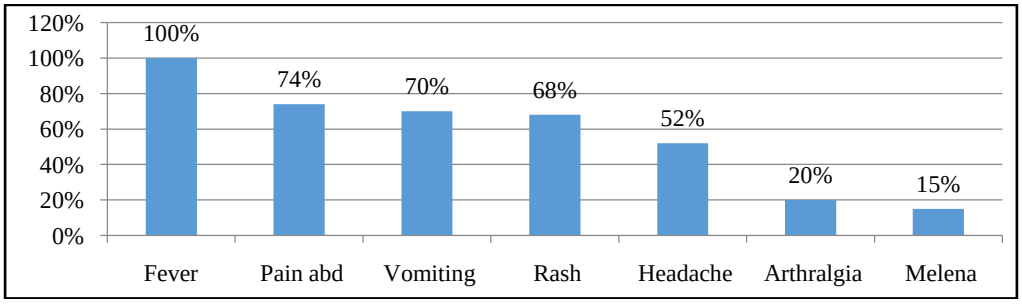

Fig.1. Distribution of symptoms in dengue fever

Table.2 Comparison of symptoms between NSD and SDF

Symptoms	NSD (n=48)	SDF (n=52)	P value =
Fever	48	52	∞ (NS)
Headache	20	32	0.04 (S)
Vomiting	27	43	0.003 (S)
Pain abdomen	30	44	0.01 (S)
Arthralgia	8	12	0.4 (NS)
Melena	3	12	0.018 (S)
Rash	31	37	0.48 (NS)

Chi-square test is used to analyze data

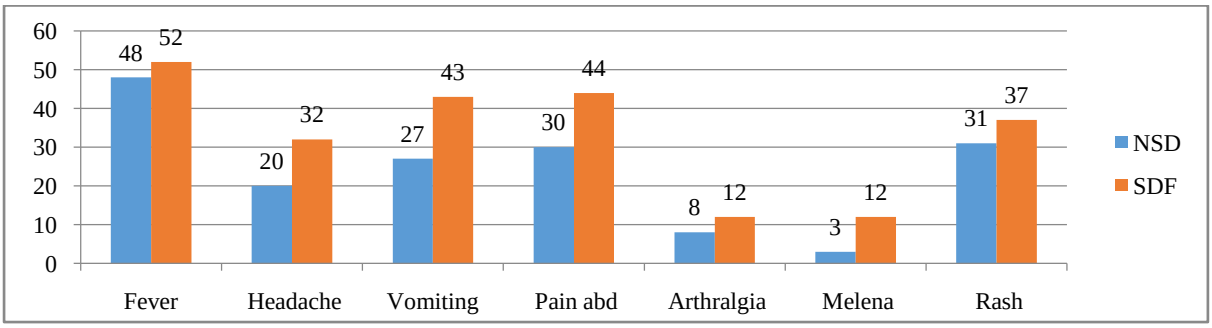

Fig.2 Comparison of symptoms between NSD and SDF

Table.3 Signs in children with NSD and SDF

Signs	Total cases n=100(%)
Hepatomegaly	95%
Petechiae	61%
Splenomegaly	46%
Edema	34%

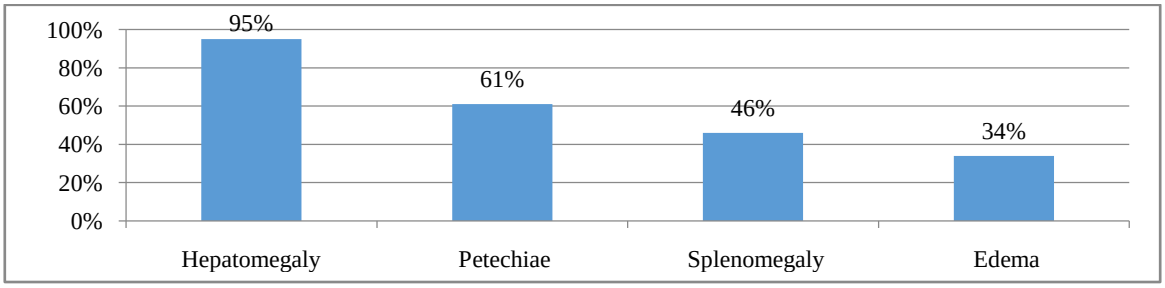

Fig.3 Distribution of signs in dengue fever

Table 4. Comparison of signs in children with NSD and SDF

Signs	NSD n=48(%)	SDF n=52(%)	p value =
Edema	12 (25%)	22 (42.3%)	0.067 (NS)
Petechiae	24 (50%)	37 (71.2%)	0.03 (S)
Hepatomegaly	44 (91.7%)	51 (98.1%)	0.14 (NS)
Splenomegaly	15 (31.3%)	31 (59.6%)	0.004 (S)

Chi-square test is used to analyze data

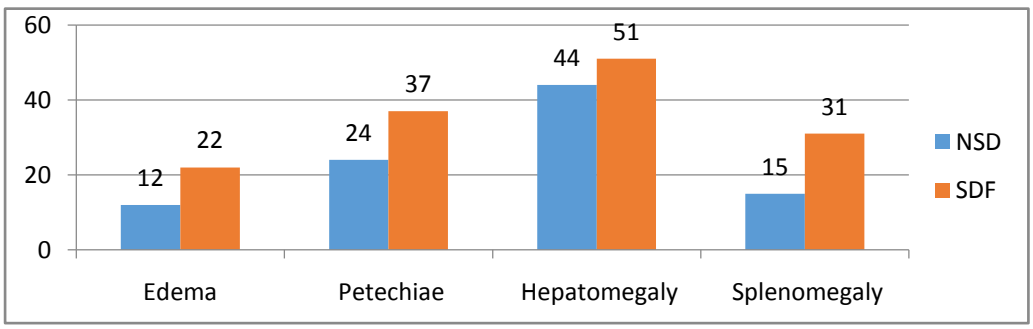

Fig.4 Comparison of signs between NSD and SDF

IV. Discussion

Dengue is an important arboviral infection in tropical countries. Global incidence of dengue fever has increased dramatically in the recent years. In our study the total number of cases analysed is 100, out of which 48 were categorised as cases of non severe dengue (NSD) which included undifferentiated fever and dengue fever without and with warning signs and 52 were cases of severe dengue fever (dengue hemorrhagic fever, grades 1–4) based on the WHO TDR 2012 dengue guidelines. Severe dengue fever (SDF) is primarily a disease of infants and children although adults may be affected with severe disease. The mean age of presentation of children with NSD and SDF in the present study is 6.87 and 6.3 years respectively which is comparable with studies by Cam BV et al[5] (median age was 7 years) and Panchareon C et al[6] (median age was 6 years). The common age group of presentation in this study is between 5-9 years.

Dengue viral infections may be asymptomatic or may lead to probable dengue or dengue with warning signs or severe dengue fever. Infants and young children usually develop an undifferentiated febrile disease that can be accompanied by a maculopapular rash. Older children and adults may develop either a mild febrile illness or the classical dengue fever characterized by fever, headache, myalgia, arthralgia and rash.

Children with NSD and SDF in this study most commonly presented with fever (100%). Results are comparable with the earlier studies done by Narayanan et al[7] among 59 cases studied 58 had fever (98%). In Kazunori et al[8] study all 143(100%) cases had fever. This may be attributed to fever being the main symptom for which most of the patient parents seek health care. Pain abdomen is more common in children with SDF as compared to NSD ($p<0.05$, S). Pain abdomen is seen in 74% of cases which is comparable to the study done by Ahmed S et al[9], 68% of cases has pain abdomen. Vomiting is present in 70% of the cases in this study and is significantly more common in children with SDF as compared to NSD ($p<0.05$, S) comparable with the study done by Aggarwal A et al[10] which had an incidence of 68%. Headache is seen in 52% of cases in this study which is more common in children with SDF compared to NSD and is statistically significant ($p<0.05$) comparable with the earlier study by Jagadeesh Kumar K et al[11] which had incidence of 57%. Rash is seen in 68% of the cases which is comparable to earlier studies by Ahmed S et al (65%) and FaridUddin et al[12] (62%).

Hepatomegaly is seen in 95% of cases which is comparable to study done by Jagadeesh Kumar K et al, had an incidence of 92%. Splenomegaly is seen in 46% of the cases which is slightly higher compared to earlier study by Aggarwal A et al which reported an incidence of 19%. Edema is seen in 34% of cases and is comparable with study by Jagadeesh Kumar K et al in which it is 40%.

V. Conclusion

This prospective observational study is conducted from January 2017 to December 2017. During this study period 100 serologically dengue positive (NS1 & IgM) cases were examined for various clinical manifestations. Among these 100 cases, 48 were non severe dengue and 52 were severe dengue fever according to WHO guidelines. Among these patients, 52% were females and 48% were males. 51% of the children were within 5-9 years of age. The mean age is 6.87 years for NSD and 6.3 years for SDF. Fever (100%), pain abdomen (74%), vomiting (70%), rash (68%) and headache (52%) were the most common symptoms and vomiting, pain abdomen and headache being more commonly seen in children with SDF. Hepatomegaly (95%), petechiae (61%), splenomegaly (46%) and edema (34%) were among the most common signs in both the groups. Petechiae and splenomegaly were more common in children with severe dengue fever.

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