ORIGINAL ARTICLE

STUDY OF CLINICAL AND DEMOGRAPHIC PROFILE OF DENGUE FEVER

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ABSTRACT: BACKGROUND: India is one of the seven identified countries in the South-East Asia region regularly reporting dengue fever (DF) / dengue hemorrhagic fever (DHF) outbreaks and may soon transform into a major niche for dengue infection in the future with more and more new areas being struck by dengue epidemics. **OBJECTIVE**: To study the clinical profile (incidence, clinical manifestations, and complications) of the dengue fever cases in our setting. To know the knowledge, attitude and practice of people with regards to dengue in the locality. **STUDY DESIGN:** Descriptive and Exploratory study. All patients admitted from May 2010 to April 2011 with the suspected diagnosis of dengue fever, dengue hemorrhagic fever and dengue shock syndrome were followed. All cases confirmed by positive serology (IgM alone or IgG & IgM both) were studied in detail and classified as Dengue fever, Dengue hemorrhagic fever and Dengue shock syndrome as per the case definition. These patients were followed, and their clinical profile, outcome along with demographic profile, knowledge regarding dengue and practices related to dengue/mosquito control were determined. The Study proforma was designed based on the objective of the study and it was pretested and used after modification (enclosed annexure). Data was analyzed using statistical software SPSS- version 16. Data were expressed as mean±SD for parametric variables and actual frequencies or percentages for non-parametric data. Comparison between groups was done using student's t test for independent groups, Chie square test, one-way Anova test, Karl Pearson's Correlation test. Statistical significance is taken at $p < .05$. **RESULTS:** Study included Total 134 dengue positive cases were admitted to the hospital from May 2010 to April 2011. 81% had dengue fever, 18.65% had dengue hemorrhagic fever and 1(.74%) had dengue shock syndrome. Most of dengue cases occurred during the month of June, 36(26.86%).Majority of the cases were from Mysore 85(63.43%), Maximum number of cases were in the age group of 26-35years, (49 out of 134(37%), Average duration of stay in the hospital was less than 7days. Fever was present in all cases, 16(11.19%) had bleeding manifestations. Leucopenia and thrombocytopenia do not go together. LFT alterations were seen mainly in SGOT and SGPT. Mean SGOT value was 238.82 ± 448.25 IU/L. Mean SGPT value was 127.89 ± 201.02 IU/Majority 82(62%) had platelet count between 20-50,000c/cumm. If there is right upper quadrant tenderness on examination, chances of finding an abnormal finding on USG is significant. Mean IgM levels among those who developed complications was 22.44±13.81 panbio units which was significantly lower than those who did not develop complications. There was no significant correlation between platelet count and IgM levels. All were given symptomatic treatment. 54 out of 134(39%) received an average of 4 units platelet transfusion, 21(16%) received steroids. There was significant association between the number of platelet units transfused and the platelet count before transfusion. Mean platelet count in those who received platelet transfusion was significantly lower than who did not receive platelet transfusion. In 21

patients who received steroids as treatment, mean platelet count was 24,190±11,070 cell/cumm, which was statistically significantly lower than those who did not receive steroids. Out of 134, 132(98%) were discharged, 9(7%) developed complications and 2 died. Among the complication 3(2%) had hepatitis, 3(2%) had encephalitis, 2(1%) had hepatitis and encephalitis. 1 had ARDS. Two patients died, one due to ARDS and the other due to multi organ dysfunction. Knowledge about dengue was present in 125(93%) patients, but only 101(75%) took preventive measures. 95(70.89%) patients knew that mosquito bite causes dengue, and 110(82%) knew that dengue spreads as well. Television and Radio were the major source of information about dengue to the common man. We found that, 50% of the study population followed simple measure of fully covering the water storage containers in order to prevent mosquito harbor. All 134 patients practiced measures to prevent mosquito bites, among them 56% used mosquito nets /screens. **CONCLUSION:** Community awareness, early diagnosis, management and vector control measures need to be strengthened, during peri-monsoon period, in order to curb the increasing number of dengue cases.

KEYWORDS: Dengue, dengue hemorrhagic fever, dengue shock syndrome.

INTRODUCTION: Dengue fever is the most common acute febrile viral disease among all the arthropod-borne viral diseases caused by dengue virus. Due to occurrence of remarkable changes in the epidemiology of dengue, currently dengue ranks as the most important mosquito-borne viral disease in the world.

The Dengue- derived from the Swahili Ki dengapepo meaning sudden seizure by a demon. The term 'break bone fever' was coined during Philadelphia epidemic in 1780.[1]

It is caused by four closely related but serologically distinct dengue virus called DEN-1, DEN-2, DEN-3 and DEN-4.[2]

It is distributed worldwide throughout tropics and subtropics between 30°N and 40°S and endemic in South East Asia, India, Pakistan and Srilanka.[3]

Dengue fever has estimated 50-100 million infections and 2,00,000 – 5,00,000 cases of DHF per year.[4] Case fatality rate is around 5%. Early diagnosis and initiation of treatment of Dengue fever prevents mortality and morbidity resulting from DHF and DSS.

The study is undertaken in view of studying the clinical profile in our setting.

MATERIAL AND METHODS:

Study Setting: This study was carried out in Apollo BGS Hospitals, a tertiary health care centre in Kuvempunagar, Mysore, Karnataka for one year from May 2010 to April 2011, which was a descriptive and exploratory study.

All patients above 15years of age admitted with clinical features of dengue fever and confirmed with positive serology in Apollo BGS hospital during the period of May 2010 to April 2011.

Method of Collection of Data: All patients admitted from May 2010 to April 2011 with the suspected diagnosis of dengue fever, dengue hemorrhagic fever and dengue shock syndrome were followed. All cases confirmed by positive serology (IgM alone or IgG & IgM both) were

studied in detail and classified as Dengue fever, Dengue hemorrhagic fever and Dengue shock syndrome as per the case definition as per WHO.[5,6] These patients were followed and their clinical profile, outcome along with demographic profile, knowledge regarding dengue and practices related to dengue/mosquito control were determined.

The Study proforma was designed based on the objective of the study and it was pretested and used after modification.

The whole study was divided into 2 sections, - Section A and Section B.

Section A comprised of

1) Clinical manifestations of patients with dengue fever
2) Profile of abnormal lab investigations in patients with dengue fever
3) Treatment received by the patients
4) Outcome –complications developed/discharged/death

Section B comprised of

1) Information about patient's socio-demographic characteristics
2) Information about patient's knowledge about dengue
3) Information about the use of preventive practices for mosquito control.

Statistics and Analysis of Data: Data was analyzed using statistical software SPSS- version 16. Data were expressed as mean±SD for parametric variables and actual frequencies or percentages for non-parametric data. Comparison between groups was done using student's t test for independent groups, Chie square test, one-way Anova test, Karl Pearson's Correlation test. Statistical significance is taken at $p < .05$.

OBSERVATIONS: Study included Total 134 dengue positive cases were admitted to the hospital from May 2010 to April 2011. 81% had dengue fever, 18.65% had dengue hemorrhagic fever, and 1(.74%) had dengue shock syndrome. (TABLE-17,FIGURE-15). Most of dengue cases occurred during the month of June, 36(26.86%) (TABLE 3, FIGURE 3). Majority of the cases were from Mysore 85(63.43%) (TABLE 4, FIGURE 4), Maximum number of cases were in the age group of 26-35 years, (49 out of 134 (37%) (TABLE 2, FIGURE 2), Average duration of stay in the hospital was less than 7 days (TABLE 24). Fever was present in all cases, 16(11.19%) had bleeding manifestations (TABLE 6, FIGURE 6). Leucopenia and thrombocytopenia do not go together (TABLE 12). LFT alterations were seen mainly in SGOT and SGPT. Mean SGOT value was 238.82±448.25 IU/L. Mean SGPT value was 127.89±201.02 IU/L (TABLE 13, FIGURE 11). Majority 82 (62%) had platelet count between 20-50,000c/cmm (TABLE 10, FIGURE 9). If there is right upper quadrant tenderness on examination, chances of finding an abnormal finding on USG is significant (TABLE 14, FIGURE 12).

Mean IgM levels among those who developed complications was 22.44±13.81 panbio units which was significantly lower than those who did not develop complications (TABLE 16, FIGURE 14). There was no significant correlation between platelet count and IgM levels. All were given symptomatic treatment. 54 out of 134(39%) received an average of 4 units platelet

transfusion, 21(16%) received steroids (TABLE 18, FIGURE 16).There was significant association between the number of platelet units transfused and the platelet count before transfusion. Mean platelet count in those who received platelet transfusion was significantly lower than who did not receive platelet transfusion (TABLE 19). In 21 patients who received steroids as treatment, mean platelet count was 24,190± 11,070cell/cumm, which was statistically significantly lower than those who did not receive steroids (TABLE 20, FIGURE 17). Out of 134, 132(98%) were discharged, 9(7%) developed complications and 2 died. Among the complications, 3(2%) had hepatitis, 3(2%) had encephalitis, 2(1%) had hepatitis and encephalitis. 1 had ARDS. Two patients died, one due to ARDS, and the other due to multi organ dysfunction (TABLE 21, FIGURE 12).Knowledge about dengue was present in 125(93%) patients (TABLE 26), but only 101(75%) took preventive measures (TABLE 25). 95(70.89%) patients knew that mosquito bite causes dengue (TABLE 28), and 110(82%) knew that dengue spreads as well (TABLE 29). Television and Radio were the major source of information about dengue to the common man (TABLE 31).

We found that, 50% of the study population followed simple measure of fully covering the water storage containers in order to prevent mosquito harbor (TABLE 32). All 134 patients practiced measures to prevent mosquito bites, among them 56% used mosquito nets /screens (TABLE 35).

1. DIAGNOSIS:

DIAGNOSIS	NO.OF PATIENTS	PERCENTAGE
DENGUE FEVER.(DF)	108	80.59
DENGUE HEMORRHAGIC FEVER.(DHF)	25	18.65
DENGUE SHOCK SYNDROME.(DSS)	1	.74

TABLE 1: Diagnostic criteria wise distribution of patients with dengue

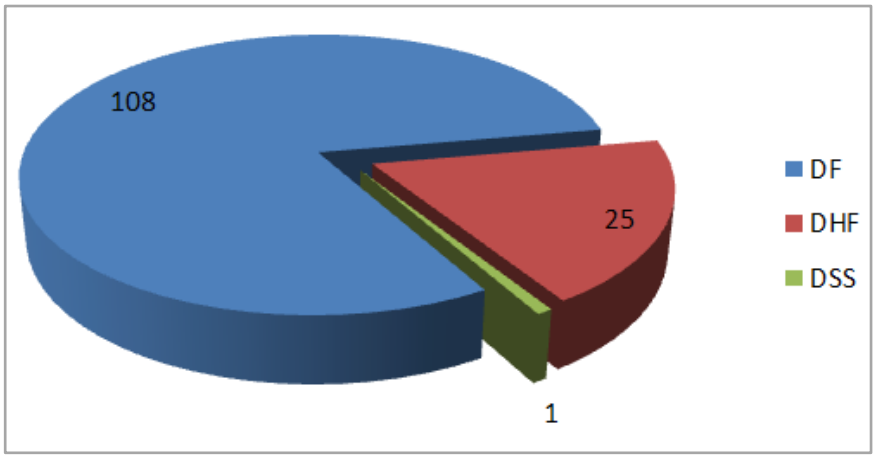

Fig. 1: Diagnostic criteria wise distribution of patients with dengue

2. SEASONAL DISTRIBUTION:

MONTHS	NO. OF CASES	PERCENTAGE
JANUARY	1	0.74
FEBRUARY	0	-
MARCH	0	-
APRIL	1	0.74
MAY	2	1.49
JUNE	36	26.86
JULY	30	22.3
AUGUST	28	20.89
SEPTEMBER	13	9.7
OCTOBER	16	11.94
NOVEMBER	1	0.74
DECEMBER	6	4.47

TABLE 2: Month wise distribution of patients with dengue in the study period

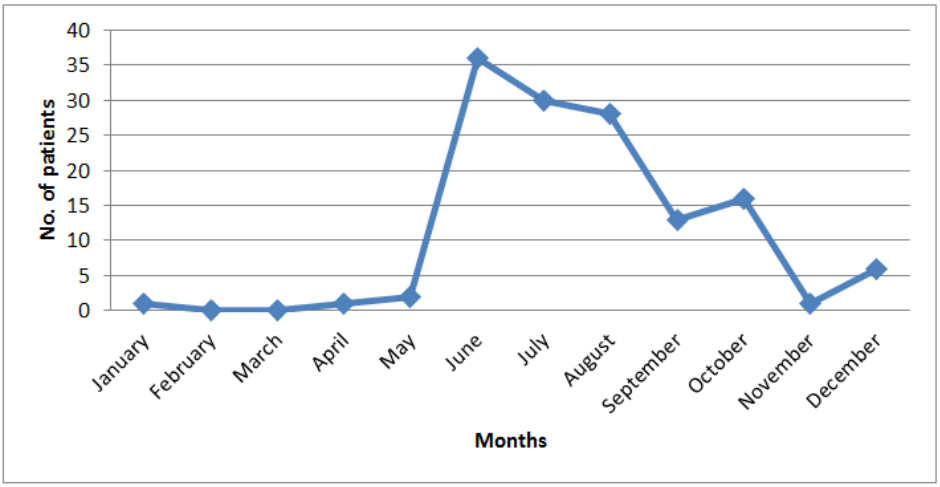

Fig. 2: Month wise distribution of patients with dengue in the study period

3. GEOGRAPHICAL DISTRIBUTION:

PLACE	NO OF PATIENTS.	PERCENTAGE
MYSORE	85	63.43
HASSAN	6	4.47
CHIKMAGALUR	1	.74
COORG	3	2.23
PIRIYAPATNA	2	1.49

DINDIGERE	1	.74
MANDYA	21	15.67
NANJANGUD	4	2.98
C.R.NAGAR	3	2.23
K.R.NAGAR	1	.74
H.D. KOTE	2	1.49
MALAVALLI	1	.74
H.N. PURA	1	.74
B'LORE	1	.74
HINKAL	1	.74
MADDUR	1	.74

TABLE 3: Geographical distribution of dengue positive cases in the present study

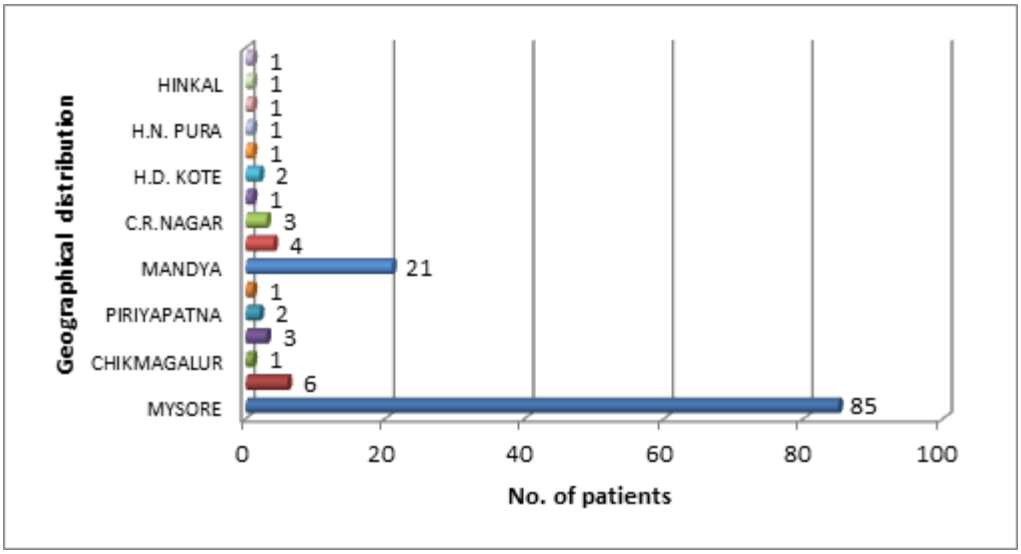

Fig. 3: Geographical distribution of dengue positive cases in the present study

4. AGE WISE DISTRIBUTION:

AGE IN YRS	NO OF PT'S.	PERCENTAGE
16-25	46	34.3
26-35	49	36.56
36-45	20	14.9
46-55	13	9.7
>55	6	4.47

TABLE 4: Age wise distribution of patients with dengue fever

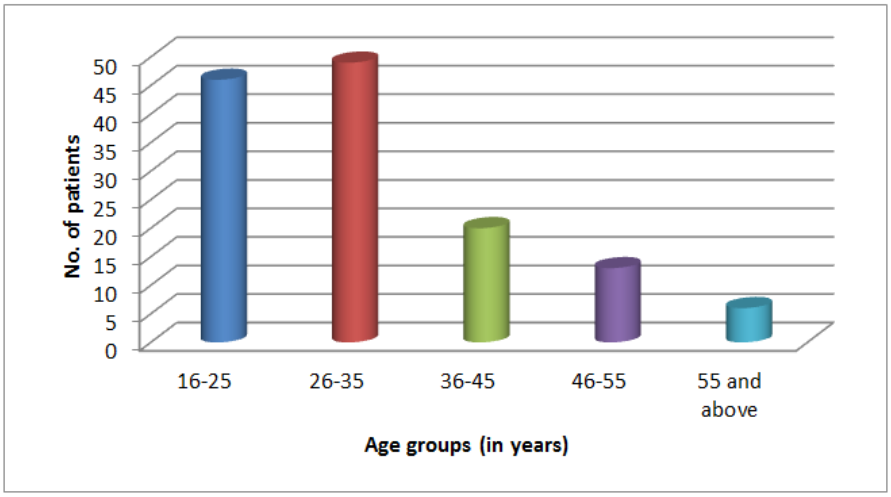

Fig. 4: Age wise distribution of patients with dengue fever

DURATION OF STAY:

No. of DAYS	NO. OF PATIENTS	PERCENTAGE
< 7 DAYS	128	95.52
8-14 DAYS	5	3.73
>14 DAYS	1	.74

TABLE 5: Distribution of patients depending on the duration of stay

5. SYMPTOM WISE DISTRIBUTION:

SYMPTOMS	NO. OF PATIENTS	PERCENTAGE
FEVER	134	100
HEADACHE	49	36.56
MYALGIA	39	29.10
NAUSEA/VOMITING	62	46.26
JAUNDICE	8	5.97
EPISTAXIS	3	2.23
HEMATEMESIS	1	.74
MALENA	5	3.73
GUM BLEEDING	3	2.23
BLEEDING P/V	1	.74
BLEEDING P/R	1	.74
HEMATURIA	2	1.49

TABLE 6: Symptom wise distribution of the patients with dengue in the study period

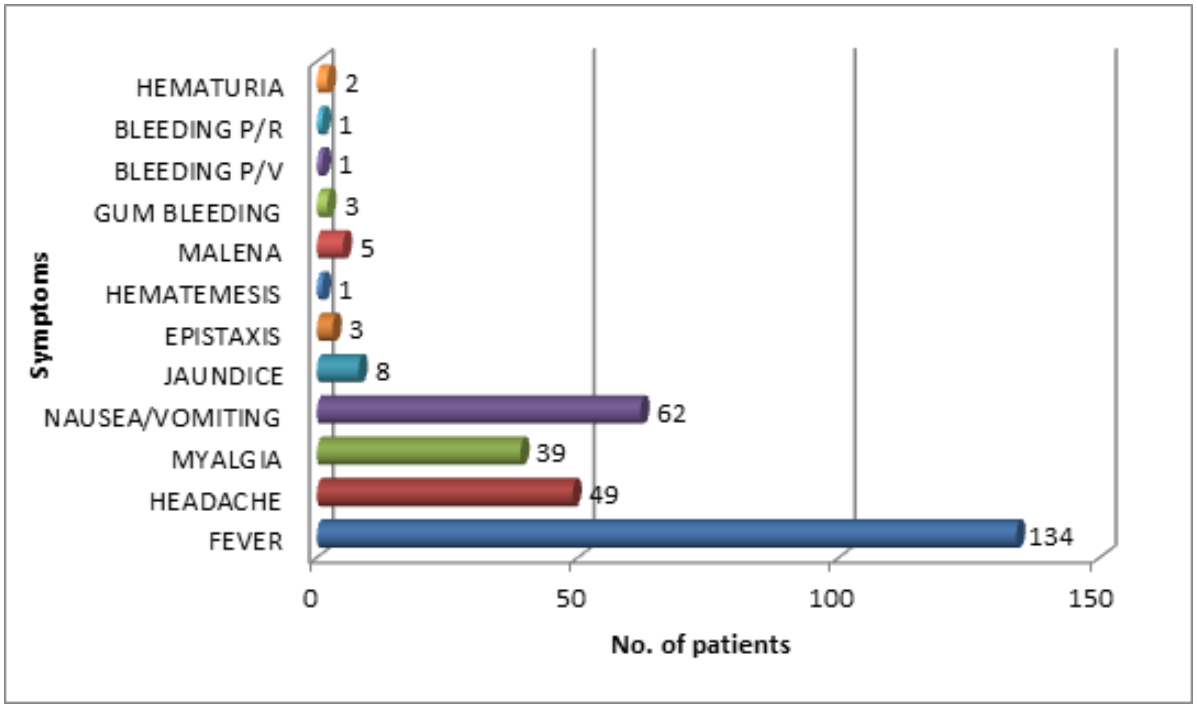

Fig. 5: Symptom wise distribution of the patients with dengue in the study period

PLATELET COUNT AND WBC COUNT COMPARISON:

	n	Platelet count (c/cumm) mean±SD	't' value	p
Leucopenia	54	42, 185±23352	.730	.467-ns
No leukopenia	80	39, 112±24, 250		

TABLE 7: Comparison of Platelet count between pts. who had leucopenia and no leucopenia

	S.bilirubin. (mg/dl)	SGOT(IU/L)	SGPT(IU/L)
Normal	125	4	13
Abnormal	9	130	121
Chi-square	X^2=100.42; P=.000	X^2=118.48; P=.000	X^2=97.05; P=.000

TABLE 8: Liver function tests in patients with dengue

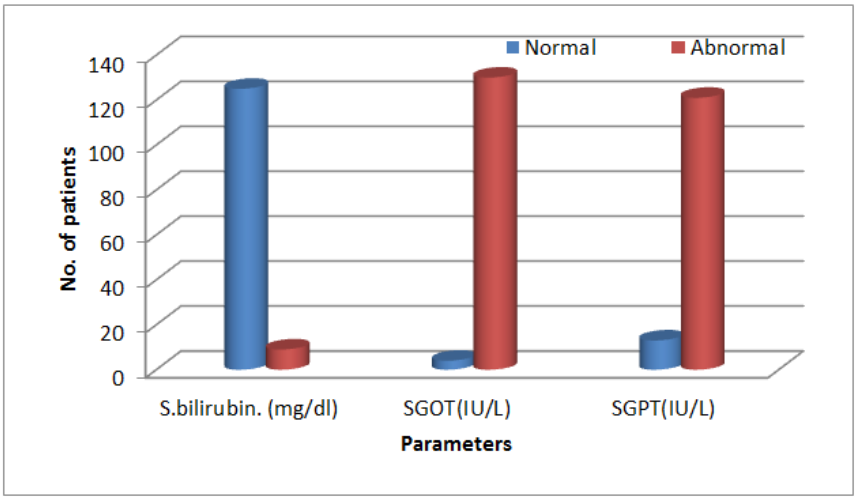

Fig. 6: Liver function tests in patients with dengue

10. PLATELET COUNT:

PLATELET COUNT IN CELL/CMM	NO. OF PATIENTS	PERCENTAGE. (%)
<20, 000	21	15.67
20-50000	82	61.94
50, 000- 1 LAKH	29	21.64
1 LAKH and above	2	1.49

TABLE 9: Platelet count distribution of patients with dengue fever

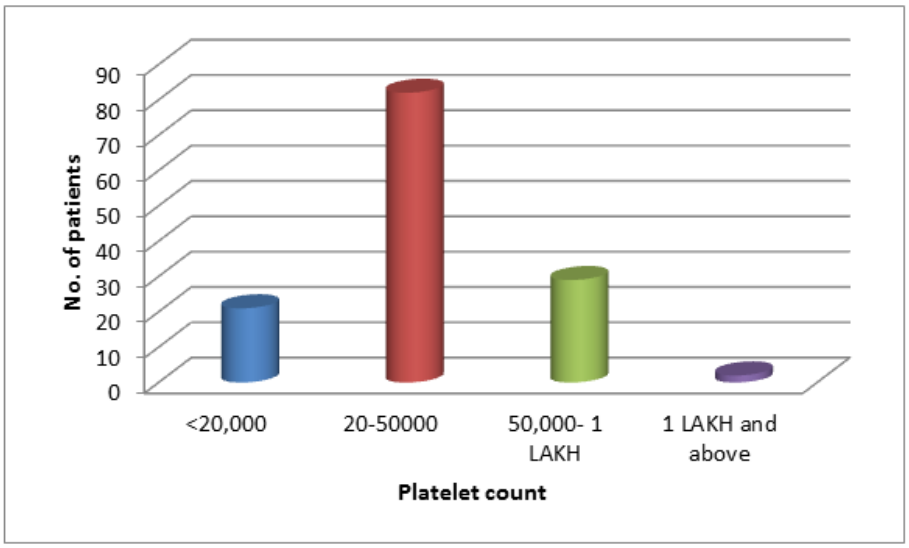

Fig. 7: Platelet count distribution of patients with dengue fever

7. PLATELET COUNT AND BLEEDING TENDENCIES:

	n	Platelet count (c/cmm) mean ± SD	't' value	p
Bleeding tendencies as the presenting complaint	16	24,625+11,401	2.887	.005
No bleeding tendencies on presentation	118	42,483.9+24,323		

TABLE 7: Comparison of platelet count in patients presenting with bleeding tendencies V/S patient's presenting with no bleeding tendencies

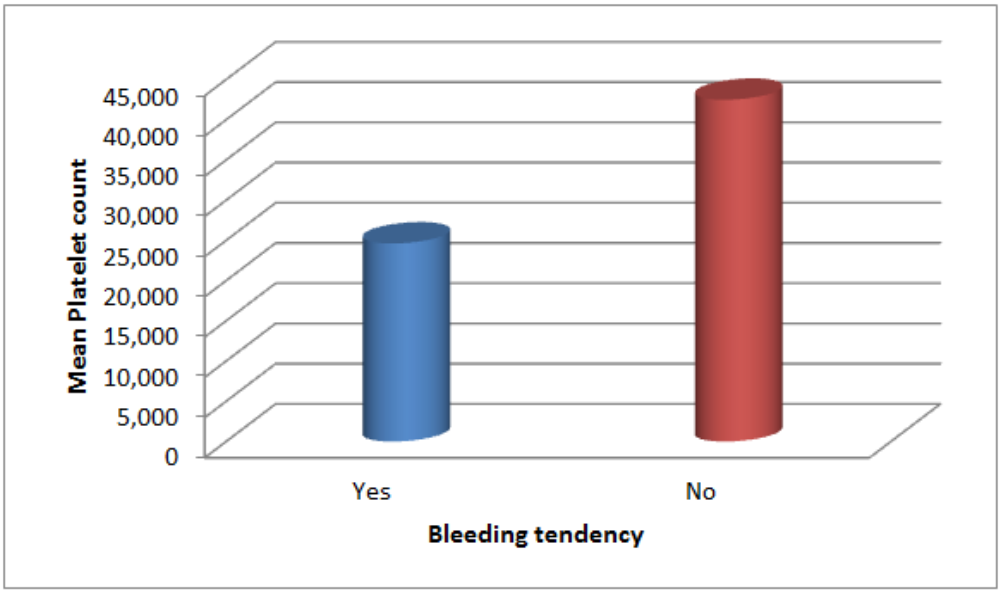

Fig. 7: Comparison of platelet count in patients presenting with bleeding tendencies V/S patient's presenting with no bleeding tendencies

14. USG ABDOMEN:

ULTRASOUND FINDINGS	NO. OF PATIENTS	PERCENTAGE
Acalculous cholecystitis	20	14.9
Gall bladder wall edema	37	27.6
NORMAL	77	57.46

TABLE 10: Ultrasound findings in patients with dengue fever

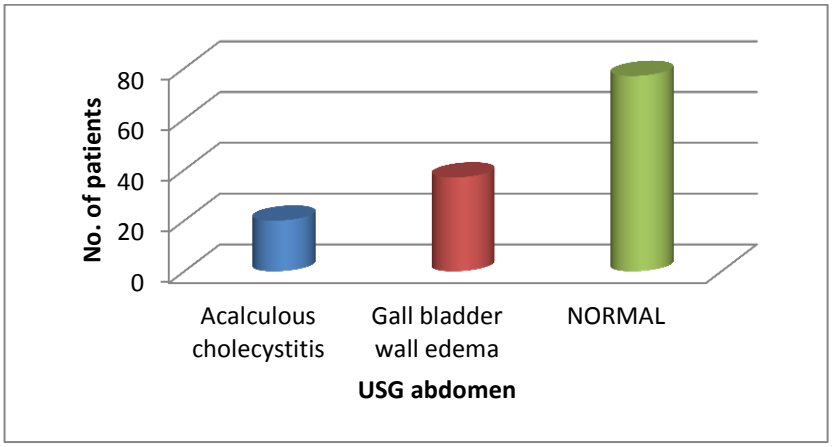

Fig. 8: Ultrasound findings in patients with dengue fever

8. SIGNS AT THE TIME OF PRESENTATION:

SIGNS	NO. OF PATIENTS	PERCENTAGE
ASCITES	2	1.49
PALLOR	6	4.47
ICTERUS	7	5.22
EDEMA	4	2.98
PETECHIAE	17	12.68
DEHYDRATION	15	11.19
RIGHT UPPER QUADRANT TENDERNESS	31	23.13
ALTERED SENSORIUM	5	3.73

TABLE 8: Signs wise distribution of patients with dengue fever

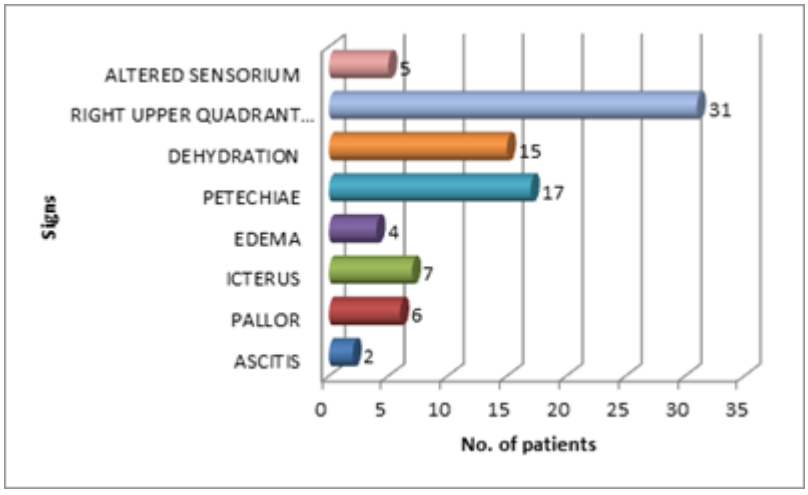

Fig. 8: Signs wise distribution of patients with dengue fever

DENGUE IGM LEVELS:

IgM LEVELS IN PANBIO UNITS.	NO. OF PATIENTS	PERCENTAGE
11-20	37	27.61
21-30	33	24.62
30-40	42	31.3
>40	22	16.41

TABLE 11: Distribution of patients according to the IgM levels measured in panbio units

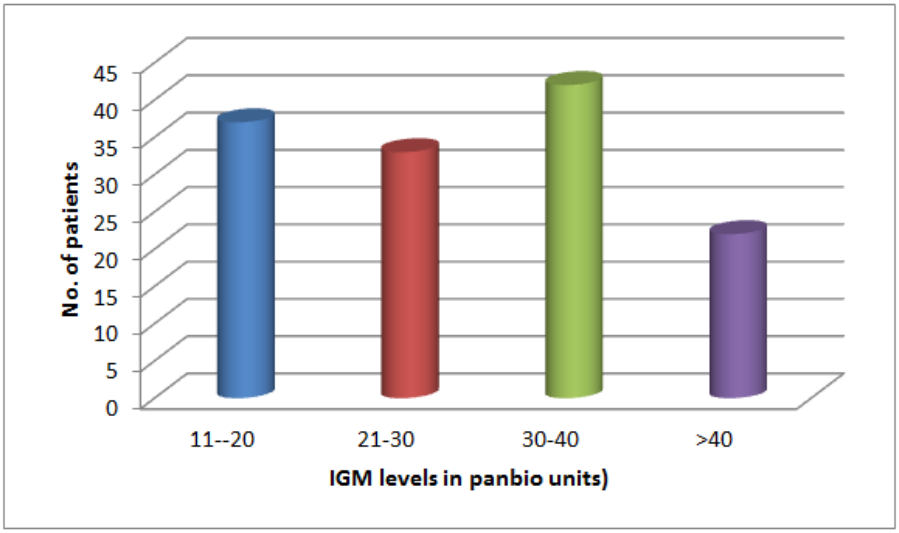

Fig. 9: Distribution of patients according to the IgM levels measured in panbio units

TREATMENT GIVEN:

TREATMENT GIVEN	NO. OF PATIENTS	PERCENTAGE
PLATELET TRANSFUSION	54	40.29
STEROIDS	21	15.67
SYMPTOMATIC TREATMENT	134	100
ANTIBIOTICS	10	7.46

TABLE 12: Distribution of dengue patients as per the treatment received

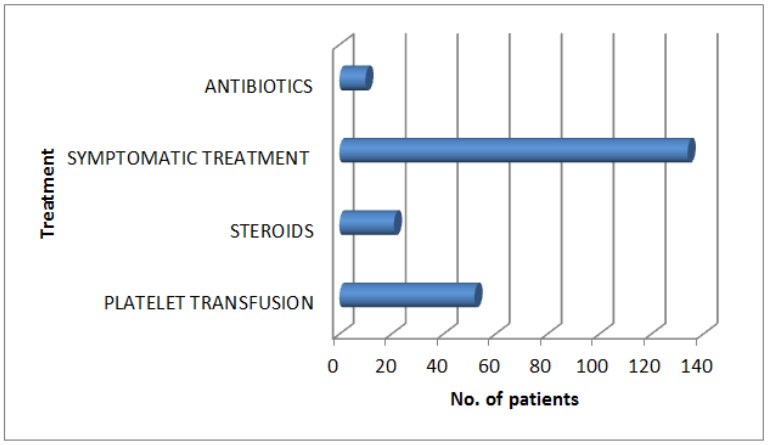

Fig. 10: Distribution of dengue patients as per the treatment received

9. PLATELET COUNT IN PATIENTS WITH PETECHIAE:

	n	Platelet count(c/cumm)	t	p
Petechiae	17	30,529±21,619	1.833	.069 (NS)
No petechiae	117	41,777±23,908		

TABLE 9: Comparison of platelet count in pt's having petechiae with pt's having no petechiae

11. WBC COUNT:

TOTAL COUNT IN CELLS/CMM	NO. OF PATIENTS	PERCENTAGE
<4000	55	41.04
4000-11, 000	73	54.47
>11, 000	6	4.47

TABLE 11: WBC count (in cells/cumm) in patients with dengue fever

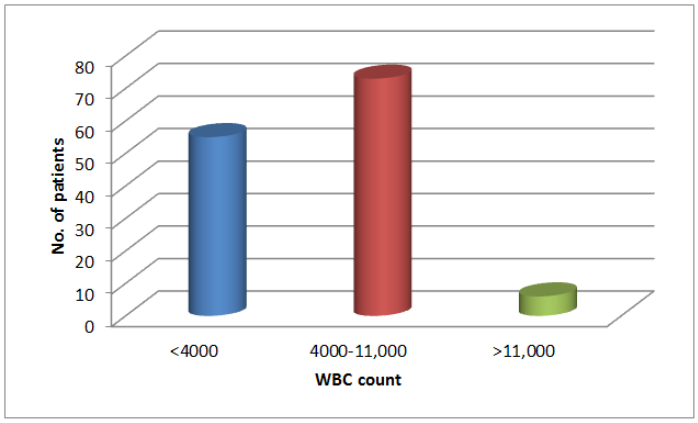

Fig. 10: WBC count (in cells/cumm) in patients with dengue fever

PLATELET COUNT AND PLATELET TRANSFUSION:

Platelet transfusion	n	Platelet count (c/cumm) Mean±SD	't' value	'p' value
Pt's who received platelet transfusion	54	26,537 ± 12,160	6.246	.000
Pt's who did not receive platelet transfusion	80	49,675 ± 25,300		

TABLE 13: Showing the comparison between platelet count among those who received platelet transfusion with those who did not receive platelet transfusion

PLATELET COUNT AND STEROID:

	n	Platelet count (in c/ cumm)	t	p
Patients who received steroids	21	24,190 ± 11,070	3.523	.001
Patients who did not receive steroids	113	43,353 ± 24,405		

TABLE 14: Platelet count in those who received steroids and those who did not receive steroids

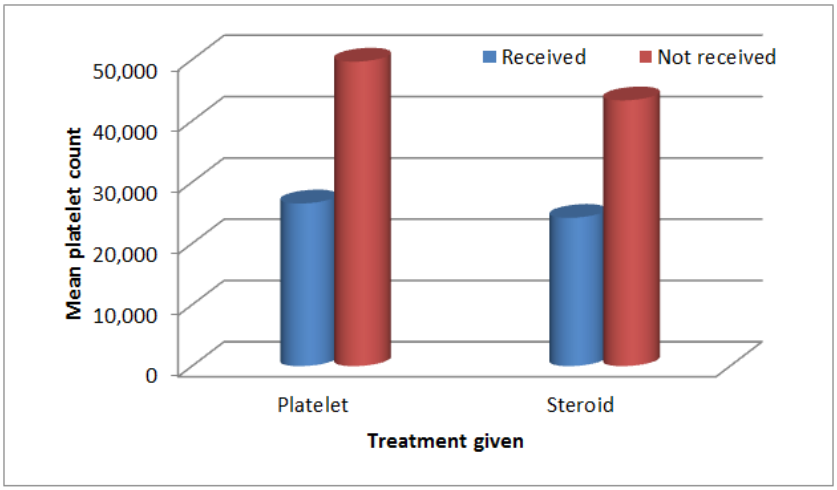

Fig. 11: Showing the comparison between platelet count among those who received platelet transfusion/steroids with those who did not receive platelet transfusion/steroid

COMPLICATIONS:

COMPLICATIONS	NO. OF PATIENTS	PERCENTAGE
ENCEPHALITIS	3	2.23
HEPATITIS	3	2.23
ENCEPHALITIS+HEPATITIS	2	1.49
ARDS	1	.74
NO COMPLICATIONS	125	93.29

TABLE 15: Complication wise distribution of patients with dengue fever

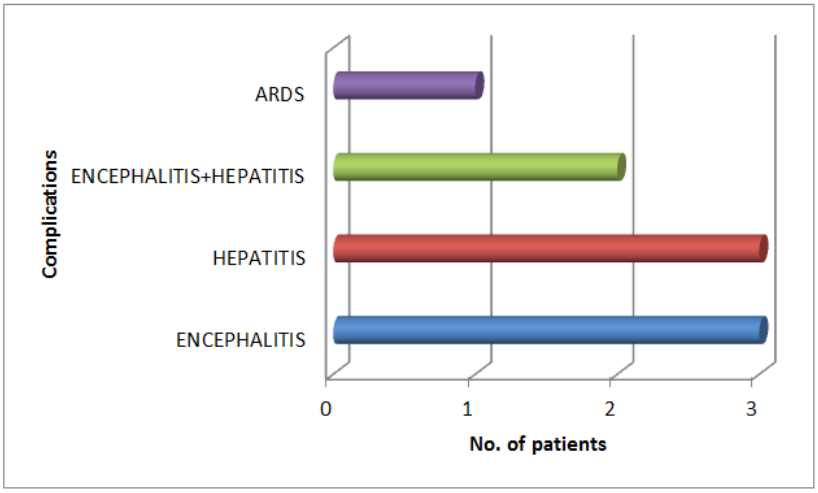

Fig. 12: Complication wise distribution of patients with dengue fever

KNOWLEDGE:

KNOWLEDGE	NO. OF PATIENTS	PERCENTAGE
PRESENT	125	93.28
ABSENT	9	6.71

TABLE 16: Distribution of patients as per their knowledge regarding the spread of dengue

PREVENTIVE MEASURES:

PREVENTIVE MEASURES	NO. OF PATIENTS	PERCENTAGE
TAKEN	101	75.37
NOT TAKEN	33	24.62

TABLE 17: Distribution of patients depending on the preventive measures taken to prevent dengue

MODE OF SPREAD OF DENGUE:

CAUSE OF DENGUE	NO. OF PATIENTS	PERCENTAGE
MOSQUITO BITE	95	70.89
DIRTY DRINKING WATER	20	14.9
ENVIRONMENT	09	6.7
OTHERS	10	7.46

TABLE 18: Showing distribution of dengue patients as per their knowledge about the mode of spread of dengue

DENGUE SPREAD:

RESPONSE	NO. OF PATIENTS	PERCENTAGE.
YES	110	82.08
NO	24	17.9

TABLE 19: Showing the distribution of dengue patients as per their response to whether dengue spreads or not

SOURCE OF INFORMATION:

SOURCE OF INFORMATION	NO. OF PATIENTS	PERCENTAGE
TELEVISION AND RADIO	76	56.7
FRIENDS AND NEIGHBORS	40	29.8
NEWSPAPERS AND MAGAZINES	18	13.43

TABLE 20: Showing the distribution of patients as per their protection of water storage containers

	NO. OF PATIENTS	PERCENTAGE
FULLY COVERED	68	50.74
SOMETIMES	36	26.86
MOSTLY UNCOVERED	30	22.38

TABLE 21: Showing the distribution of study population as per the protection of water storage containers

PREVENTIVE MEASURES TAKEN:

PREVENTIVE MEASURES TAKEN	NO. OF PATIENTS	PERCENTAGE
MOSQUITO NETS/SCREENS	76	56.71
REPELLANTS	34	25.37
CLOSED WINDOWS	14	10.44
BURNING NEEM/HERBS/SMOKE	10	7.46

TABLE 22: Showing the mosquito preventive measures undertaken

The present study highlights the importance of dengue fever to clinicians in the areas of epidemiology, manifestations, complications and outcome of the disease. The study has the limitations inherent to a hospital record-based study, so meteorological and entomological data, information, education and communication (IEC) strategies and vector control measures initiated by the government are not correlated.

DISCUSSION: The commonest age group of the patients in our study was 26-35 years. This was comparable to other studies of Priyadarshini et al[7] and Neeraja et al.[8] Of the 134 patients in the study group 85 patients (63.4 %) were males and 49 (36.56%) were females. The Male to female ratio was 1.73:1. This was in agreement with other studies by Agarwal et al,[9] Ashwini kumar et al[10] and Neeraja M et al which can be attributed to their outdoor activities, and increased exposure to mosquito bites and hence viruses. In a study conducted by Kamal S et al.[11] Females were more commonly affected. The disease shows seasonal distribution. It is observed that disease was seen more during the months of June, July, August, September, October and November, which corresponded to the monsoon and post –monsoon season. Most of the cases in our study have occurred from the months of June to November, Most of the other studies have similar observations. This can be attributed to the presence of an environment favorable for the breeding of the vector Aedes aegypti.

Most of the cases in our study were from the local district (Mysore) i.e. with 85 out of 134 patients (63.43%) from Mysore, 21(15.67%) from Mandya, a neighbouring district 6 (4.47%) from Hassan and 1(.74%) from Chikmagalur, K.R. nagar, Bangalore and surrounding places. As already mentioned this is because the referred cases from the surrounding districts are included in the study, but from the local area more patients are reported only because of easy accessibility to the hospital. In our study we found that 115 out of 134(85.82%) were literates. Educated people tend to concentrate in urban areas- which probably increases density of population and hence chances of mosquito bites. However we expected better literacy rate helps in better preventive measures- which is not as per this study. With regards to clinical features in our study fever was invariably (100%) present in all 134 patients which was associated with nausea and vomiting as presenting symptom in 62(46.26%), headache in 49(36.56%), myalgia in 39(29.10%), 16(11.19%) had bleeding tendencies, 8 out of 134(5.97%) had jaundice as presenting complaint. Of the patients presenting with bleeding tendencies the mean platelet count was significantly lower than in the patients who presented without bleeding tendencies (Table 7). However in those who had petechiae even though platelet count was lower compared to who did not have petechiae it was statistically not significant

On examination, out of the 134 patients in our study 31(23.13%) had right upper quadrant pain, 17 (12.68%) had petechiae and 15(11.19%) were dehydrated, 7(5.22%) were icteric, 5(3.73%) had altered sensorium. Of the 31 patients who had right upper quadrant pain, on ultrasound examination 20 had gall bladder wall oedema, 7 had acalculous cholecystitis and 4 were normal. In a study conducted by Sharma et al[12] in Chandigarh, it was found that 14 out of 27 patients (51%) with pain abdomen were detected to have acalculous cholecystitis, whereas in our study 64% of patients with pain abdomen were detected to have gall bladder wall oedema and 22% of patients with pain abdomen were found to have acalculous cholecystitis. Right upper quadrant pain is an important sign and symptom in dengue fever. In the light of acute febrile illness, during monsoon season dengue should be considered as an important differential diagnosis for many of the acute pain abdomen in surgical settings, and every patient should undergo platelet count test.

In our study chest x ray was reported abnormal in 31/134(23.13%), bilateral pleural effusion was seen in 29, (21.64%) and 1(.74%) had pulmonary edema and 1 had ARDS. Mean

IgM levels in our study was 29.57±11.2 panbio units and there was no significant association between platelet count and IgM levels.

In our study, dengue illness manifested as DF in 80.59%, DHF in 18.65% and DSS in.74%. Similar reports were published by Priyadarshni et al. A study by Malavige et al[13] showed more number of DHF cases than DF cases. Other studies by Ashwini kumar et al and Neeraja et al showed more number of DF and DHF patients and less of DSS patients. In our study mean platelet count in DF patients was 42,000 c/cumm, In DHF 31,00c/cumm, In DSS it was 21,000c/cumm. In our study, we found that among 134 patients, symptomatic treatment was given to all (100%), platelet transfusion was given to 54, 21(15.67%) received steroids and 10(7.46%) were given antibiotics. In those who received platelet transfusion mean platelet count was 26,537+12,160 cell/cumm. On an average 4 units were transfused.

There was significant correlation between the number of platelet units transfused and the platelet count before transfusion. So even though it is difficult to recommend as to the level of platelet count where platelet transfusion is indicated from our study, probably it is prudent to withhold platelet transfusions until platelet count drops <25,000 cells/cumm. Or transfuse at higher platelet counts if there are bleeding manifestations.

Among 134 patients in our study, 9(6.71%) developed complications, which can be compared to a study by Ashwini kumar et al where in 14% developed complications. However, the type of complication developed could not be compared. In our study out of 9 who had complications 3(2.23%) had encephalitis, 3(2.23%) had hepatitis, 2(1.49%) had encephalitis and hepatitis, and 1(0.74%) developed ARDS. Mean platelet count among those who developed complications was 38,444±22,055cell/cumm which was low compared to those who did not develop complications even though it was not statistically significant. Mean IgM levels among those who developed complications was 22.44±13.81 panbio units which was significantly lower compared to those who did not develop complications. So it can be postulated better immune response in the form of higher IgM levels probably gives some protection against complications. Among 134 patients in our study, 132(98.5%) were discharged, 9(6.71%) developed complications, and 2(1.49%) died, 1 due to ARDS and the other one due to multi organ dysfunction. Complications rate in Dengue is about 5-6% which probably cannot be predicted based on any of the parameters measured in our study. However once they develop features of Dengue careful monitoring of vital parameters, platelet count probably helps in preventing complications and death.

Mortality in our study was only about 2%, which can be compared to study conducted by Ashwini kumar et al, where the mortality was 2.4%. Mean duration of stay in this study was less than 7 days. Among 134 patients in this study, 101(75.37%) had taken preventive measures against dengue in the form of using mosquito repellants, and nets, 125(93.28%) had knowledge about the dengue fever, its mode of spread and manifestations. Regarding symptoms of dengue, 60% knew about fever. In the present study, television was the most important source of information (57%). This is similar to a study from Delhi.[14]

This shows that mass media like television is a very important source of information and this can be further used to disseminate more awareness regarding dengue. The above observations may be true only for the study population because of convenient sample and cannot

be generalized to other populations belonging to different socio-economic or cultural backgrounds.

Awareness, and practices related to dengue can be compared to a study conducted by Anitha Acharya et al.[14] and it is observed that, the most common cause of dengue was cited as 'mosquito bite' (71%). Other causes mentioned included dirty drinking water (15%) and environment (7%). Only 82% respondents said that dengue can spread and out of them 71% knew that it spreads through mosquito bite. Another 15% said that 'dirty drinking water' was the mode of spread. Over 60% were aware of "fever alone" or accompanied by chills (12%), headache was mentioned by 15% as symptom of dengue.

Regarding Preventive measures, majority (25%) used mosquito repellents like matt/liquid vaporizers /coils. Important sources of information about dengue were from television (57%), friends and neighbors (30%). Role of media was found to be limited with magazines (13%).

The possible reasons for better awareness could be repeated exposure to health education messages on dengue and other mosquito-borne diseases through exposure to mass media like television and geographic differences. Mosquito bite was cited as a cause of dengue by 71% respondents, which is similar to a study done in New delhi.[14] However, around 15% had the misconception that dirty drinking water could be the cause.

It is observed that only 71% respondents mentioned mosquito bite as cause of dengue, but18% did not know that the disease could spread by mosquito bite.
This shows their inadequate knowledge and a need for more health education for their better participation in control measures.

Regarding symptoms of dengue, 60% knew about fever. In the present study, television was the most important source of information (57%). This is similar to a study from Delhi. [14]

This shows that mass media like television is a very important source of information and this can be further used to disseminate more awareness regarding dengue.

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