



FEASIBILITY AND USEFULNESS OF NEW DENGUE CLASSIFICATION VS OLD CLASSIFICATION

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ABSTRACT

Introduction: Dengue cases, traditionally classified as dengue fever (DF) or dengue haemorrhagic fever (DHF) by the World Health Organization (WHO) in the year 1997, now are categorized into without warning signs, with warning signs (e.g., abdominal pain/vomiting/fluid accumulation/mucosal bleeding/lethargy/liver enlargement > 2cm/increasing haematocrit with decreasing platelets) by the WHO 2009 version.

Aim: To evaluate the feasibility and usefulness of new dengue classification over the old ones in treatment of patients.

OBJECTIVES

- To evaluate the clinical feature and complications of dengue fever.
- Risk factors to assess severity of dengue.
- Usefulness of various classifications in treatment and prognosis of dengue fever

Methodology: Our study will include 60 patients presenting with dengue fever at Mahatma Gandhi Mission's (MGM) Hospital Aurangabad for a duration of 6 months. All confirmed cases of dengue fever either NS1 or IGM positive will be included in the study.

Results: Abdominal pain was present in 75% of cases, 22% patients had bleeding manifestations, 62% cases had hepatomegaly, 72% cases had right hypochondrial tenderness. Haematocrit improved in < 5 days in 28.1% of total cases. Out of total cases 50.1% required fluids at rate between 2-3cc/kg/hr, 15.5% cases required fluids at rate between 3-4cc/kg/hr and > 4cc/kg/hr in 34.4% cases. Diuretic phase started in < 5 days of fever in 40.7% of total cases, 87.4% cases regression occurred in > 7 days. Platelets had increased in 78.1% cases in > 5 days of fever. Out of all cases 59.4% had warning signs while 40.6% were without warning signs. Out of all cases with warning signs 32% cases took > 5 days for regression, increase in platelets, start of diuretic phase while 27% of cases without warning signs > 5 days for the same.

Conclusion: Those with warning signs required more time for regression compared to those without warning signs but there was no change in the treatment aspects of these cases and the newer classification was useful for early identification and prognostication of severe dengue.

KEYWORDS :

Dengue is a vector-borne disease that is a major public health threat globally with rapidly changing epidemiology and its prevalence has increased since the past 10 years with India experiencing the highest dengue incidence in 2012 (about 41 per million population), 2013 (61 per million population) and 2014 (32 per million population).¹

• CLINICAL CLASSIFICATION OF DENGUE:²

- 1) Who Classification Used Since 70's
- 2) Who-tdr 2009 Dengue Guidelines Classification

A group of scientists and doctors had set up a multi-country collaborative dengue study, called DENCO to evaluate the WHO classification including the clinical presentations of dengue in order to find the best solution for the management of suspected dengue patients and minimize the Case Fatality Rate. This DENCO project was supported by the European Union and WHO Special Program for Research and Training in Tropical Diseases (TDR) and this clinical part was done during 2005-2006. The group proposed the new classification based on the results of the DENCO study. WHO Tropical Diseases research (TDR) had published this new suggested classification in the 2009 new guidelines for diagnosis, treatment, prevention and control^{2,3} for possible replacement of the current WHO classification that has been used effectively in reducing CFR, especially in the Southeast Asia and Western Pacific Regions for more than three decades⁴.

We wanted to evaluate the usefulness of the newer classification not only for early identification of severity of disease but also to look for its feasibility in management

aspect and for prognostication of the disease.

MATERIALS AND METHODS:

A combined prospective and retrospective study of the suspected dengue patients who were admitted in paediatric ward or Intensive Care Unit was done in MGM Hospital Aurangabad between June-October 2018.

Only those children will be enrolled in a study whose parents/guardians agree to the informed consent. The decision of consultant (guide) will be final while considering inclusion of cases. All NS1+ and IGM+ cases were included in the study.

Patients detailed history and examination was done, investigations entered during the period of stay. Patients were classified as per the old and new classification.

Traditional Classification:

Probable DF: Fever with 2 of the following: headache, retro-orbital pain, myalgia, arthralgia/bone pain, bleeding manifestations, rash and leukopenia².

DHF case definition using 4 criteria: Fever, bleeding manifestation including positive tourniquet test (> 10 petechiae/sq. inch), plasma leakage (hemoconcentration > 20%, pleural effusion, ascites detected by physical examination, chest film-right lateral decubitus technique or ultrasound) and thrombocytopenia (platelet count < 100,000 cells/mm³). Plasma leakage is determined in most cases by hemoconcentration (rising Hct > 20%). Some of the cases, pleural effusion and ascites were detected by physical

examination, chest x-ray (right lateral decubitus technique), ultrasonography, hypoalbuminemia (serum albumin < 3.5 gm% or change of albumin > 0.5 gm%) or hypocholesterolemia (serum cholesterol < 10(1 mg% or change of cholesterol > 20 mg%). Ultrasonography was performed in suspected DHF cases without evidence of hemoconcentration or pleural effusion by CXR².

New Classification:

Dengue Fever: Fever with 2 of the followings: Nausea/vomiting, rash, aches and pain, tourniquet test positive, leukopenia, any warning sign.

Warning signs: abdominal pain or tenderness, persistent vomiting, clinical fluid accumulation, mucosal bleed, lethargy/restlessness, liver enlargement > 2 cms. and laboratory: increase in Hct concurrent with rapid decrease in platelet count².

SD-severe plasma leakage (shock, fluid accumulation with respiratory distress), severe bleeding evaluated by clinicians and severe organ involvement (AST or AUT > 1,000 U, CNS-impair consciousness and heart and other organs involvement)².

- CBC (Complete Blood Count)
- LIVER TRANSAMINASE
- DENGUE NS1 & IGM
-

OPTIONAL: CHEST X-RAY, RFT, WIDAL, PT-INR

The collected data was compiled in Excel sheet 2007. For analysis of this data SPSS version 20 software was used. Qualitative data is been represented in the form of frequency and percentage. This data is also represented in the form of visual impression like tables etc. The quantitative data is been represented in the form of mean and standard deviation. For comparison of two groups T-test will be applied, p value will be checked at 5% level of significance.

Apart from identifying the clinical and epidemiological patterns of dengue a comparison was done between the two classifications on their effect on treatment, early improvement and prognostication.

RESULTS:

- Out of 60 patients enrolled in our study 46 (76.66%) were NS1+, 2 (3.33%) were IGM+ while 12 (20%) were both NS1 & IGM+.
- Male predominance was seen with 34 (56.66%) cases suffering from dengue.
- Most common symptoms seen were Abdominal Pain in 40 (66.66%), nausea in 34 (56.66%), facial puffiness in 26 (43.33%), myalgia in 24 (40%), headache in 24 (40%).
- Most common signs being right hypochondrium tenderness in 50 (83.33%), hepatomegaly in 46 (76.66%) of cases.
- Probable Dengue: 33 (55%) Dengue Fever: 11(18.33%)
 DHF: 26 (43.33%) Dengue with warning signs: 45 (75%)
 DSS*: 1 (1.66%) Severe Dengue: 4 (6.66%)

*: Dengue Shock Syndrome

TABLES

TABLE 1

Platelets Improved On	Probable Dengue	DHF	DSS	Dengue Fever	Dengue With Warning Signs	Severe Dengue
<5 DAYS	4	3	0	3	4	0
>5DAYS	29	23	1	8	41	4
TOTAL	33	26	1	11	45	4

Chi Square Value : 0.139 , P Value=0.993 (p<0.05) Non Significant (old Classification)

Chi Square Value: 3.46 , P Value=0.177 (p<0.05) Non Significant (new Classification)

TABLE 2

Hct Improved On	Probable Dengue	DHF	DSS	Dengue Fever	Dengue With Warning Signs	Severe Dengue
<5 Days	12	5	0	4	13	1
>5 Days	21	21	1	7	32	4
Total	33	26	1	11	45	5

CHI SQUARE VALUE : 2.5 , P VALUE=0.286 (P<0.05) NON SIGNIFICANT (OLD CLASSIFICATION)

CHI SQUARE VALUE: 0.474 , P VALUE=0.789 (P<0.05) NON SIGNIFICANT (NEW CLASSIFICATION)

TABLE 3

Start Of Diuretic Phase On	Probable Dengue	DHF	DSS	Dengue Fever	Dengue With Warning Signs	Severe Dengue
<5 Days	12	5	0	4	13	1
>5 Days	21	21	1	7	32	3
Total	33	26	1	11	45	4

Chi Square Value : 6.99 , P Value=0.03 (p<0.05) Significant (old Classification)

Chi Square Value: 1.35 , P Value=0.510 (p<0.05) Non Significant (new Classification)

TABLE 4

Regression Of Disease On	Probable Dengue	DHF	DSS	Dengue Fever	Dengue With Warning Signs	Severe Dengue
<5 Days	1	2	0	0	2	2
>5 Days	32	24	1	11	43	2
Total	33	26	1	11	45	4

CHI SQUARE VALUE : 0.719 , P VALUE=0.698 (P<0.05) NON SIGNIFICANT (OLD CLASSIFICATION)

CHI SQUARE VALUE: 13.2 , P VALUE=0.001 (P<0.05) SIGNIFICANT (NEW CLASSIFICATION)

TABLE 5

Old Classification 1997	Dengue Fever	Dengue Fever With Warning Signs	Severe Dengue	New Classification
Probable Dengue	6	25	2	33
DHF	5	20	1	26
DSS	0	0	1	1
Total	11	45	4	60

CHI SQUARE ANALYSIS: 14.4

P VALUE: 0.006 (P<0.05) SIGNIFICANT

TABLE 6

Fluid Requirement	Probable Dengue	DHF	DSS	Dengue Fever	Dengue With Warning Signs	Severe Dengue
1-2CC/KG/HR	0	0	0	0	0	0
2-3CC/KG/HR	31	19	0	9	35	2
3-4CC/KG/HR	2	7	0	2	10	1
>5CC/KG/HR	0	0	1	0	0	1

CHI SQUARE VALUE :79.5 , P VALUE=0.000(P<0.05)
SIGNIFICANT (OLD CLASSIFICATION)

CHI SQUARE VALUE: 13.5 , P VALUE=0.006 (P<0.05)
SIGNIFICANT (NEW CLASSIFICATION)

DISCUSSION:

The 2009 WHO Dengue Classification was made in order to make a criteria for differentiating between severe and non-severe dengue. While most of the studies showed how sensitive the newer classification was to detect severe dengue cases none have discussed for its use in prognostication and usefulness in treatment.

Main aim for a newer classification was to help a health professional identify cases of severe dengue and decide who needed hospital admission and intensive monitoring.

Our study showed maximum cases detected by the newer class into the warning signs criteria ,thereby helping in early identification of to be severe cases and early treatment of these cases with a good outcome.

In a study by Narvaez et al ⁵ were of the view that "new classification criteria were found to be far more sensitive and specific in detection of patients with severe dengue, when compared to the traditional criteria."

They found that the presence of all the WHO warning signs such as abdominal pain, vomiting, clinical fluid accumulation were higher in patients with severe dengue similar to our study.

As per Barniol et al ⁶ , they were of the view that "In most countries, no algorithm for triage and dengue case management existed prior to this study. Therefore, most medical staff welcomed the decision-making algorithm as practical support." The older classification was based more on laboratory tests and physical parameters such as blood pressure monitoring which is not feasible in resource poor settings, hence the newer classification helps the staff and medical professionals to triage on the basis of multisystem clinical approach and plan treatment accordingly.

But it was observed that through the newer classification though maximum patients with impending severity were diagnosed as those with warning signs but time for regression still took more than 5 days similar to those cases classified as per old classification.

The time taken for normalisation of platelets, HCT and regression of disease as per both classifications showed that it took > 5 days in both scenarios, but the newer classification was better in decision making for fluid requirement compared to the older classification.

CONCLUSION:

- Platelet and hematocrit improvement is better evaluated by newer classification
- Start of diuretic phase is better evaluated by old classification
- But overall regression of disease takes more than 5 days in all and is better evaluated by newer classification
- As far as treatment aspect is considered the newer classification is better as it indicates severity of disease and is useful in prognosis of dengue, more severe the disease more is the fluid requirement which has been shown in this study.
- The newer classification is a better judge to assess risk factor of disease as the previous classification focused more on bleeding and blood pressure while the newer classification focuses on multiorgan assessment approach.

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