CLINICAL OBSERVATIONS ON DENGUE HEMORRHAGIC FEVER (DHF) IN METRO MANILA (1977-1979)

By Fe del Mundo, MA, MD and Lolita Soriano, MD

Introduction

In the Philippines, dengue and dengue-like infections, including the hemorrhagic type in epidemic forms were reported from time to time since 1903. However, it was not until 1954-1958 during an alarming outbreak, that the disease caused increasing concern and attention by physicians, government health authorities and parents. In about four or five years such concern spread in neighboring countries in view of outbreaks and alarming manifestations, particularly in Thailand and Singapore.

Epidemics of different proportions and severity of this viral infection in the region and in the country have been reported since 1954. At present Dengue Hemorrhagic Fever is considered one of the major health problems of WHO Southeast Asian and Western Pacific Regions and the disease is sometimes called Philippines, Thai or Singapore Hemorrhagic Fever. In the Philippines it is popularly known, for short, as H-Fever.

A WHO Southeast Asian Regional Conference in 1964 encouraged researches on various aspects of the disease and remarkable progress has been attained, particularly in the knowledge of its pathology and pathogenesis. Whereas it was a mysterious disease in 1954 much has been accomplished, through concerted efforts towards a better understanding of this hemorrhagic viral infection.

An alarmingly large epidemic in 1966 made it possible for the authors to study clinical manifestations of serologically-proven cases of DHF as there was much confusion in the symptoms and diagnosis of the disease, resulting in a rather inaccurate reporting of cases.

After that year, the disease has been noted to be endemic in the Philippines though the incidence has remained at low levels. The next reported outbreak was 6 years later (1972). From this trend another one was expected in 1978 but this did not occur. Both incidence and mortality rates have been less.

WHO has organized a Technical Advisory Committee on DHF for the Southeast and Western Pacific Regions which periodically

***Children's Medical Center, Philippines and its Institute of Community and Family Health.**

meets to pool experiences and prepare guides. A Dengue Newsletter has been prepared by this Committee since 1975, to bring the latest information on DHF to health workers and administrators.

The present study is an observation on clinical manifestations of DHF based on serologically proven cases admitted at the Children's Medical Center in a period of 2 years (1977-1979). The findings and trends in this study were compared with those of a similar study in 1966.

Objectives

The present study was undertaken with the following purposes:

1. To observe current clinical manifestations of DHF.
2. To follow the morbidity pattern of the disease.
3. To determine changes in the prognosis and outcome of the disease.
4. To detect early manifestations and prompt recognition of the disease, particularly its serious forms.
5. To seek ways of preventing and overcoming complications.

Materials and Methods

A total of 399 dengue fever suspects admitted at the Children's Medical Center from January 1977 to April 1979 were included in the study. Epidemiologic data, clinical manifestations and the course and outcome of each patient were recorded.

In the physical examination close attention was paid to manifestations which were found significant in other countries but which were not very impressive in previous Philippine reports.

Laboratory examinations included:

Blood pressure and tourniquet test
Complete blood count or WBC
Hematocrit
Platelet count
Viral serology — paired acute and convalescent specimens.

The first four procedures were repeated as indicated. As compared to 1966, the present laboratory work-up were much less. Thus in 1966, a peripheral smear review by a hematologist, the bleeding time, coagulation time, widal reaction, the fragility test, prothrombin time and a viral culture were done for each patient.

On the whole the incidence of the disease during the period of the study was low and serious forms were rare so that there were not sufficient cases to make the findings significant or impressive. A plan to study different modalities of management of the severe forms were not possible in this group since there were only 8 such cases and one was confined in another hospital.

Age Distribution

The age distribution of the present series (102 patients) is shown in Table III. About half of the cases were in the 5 to 9 year -old groups. This is the same age period that had the highest incidence in the 1966 study.

Table III. Age Distribution of 102 Serologically Confirmed Dengue Cases Jan 1977 — April 1979

Age Group	*Number*	*Percentage*
0 — 4 years	23	22.5%
5 — 9 years	56	54.9
10 — 15 years	19	18.6
16 — 19 years	3	2.9
20 — 24 years	1	0.98

Sex Incidence

The sex incidence (Table IV) showed a slight difference in the number of male and female patients and statistical analysis gave no difference. Other reports show no significance in the sex factor.

Table IV. Sex Distribution of 102 Serologically Confirmed Cases Jan 1977 — April 1979

Sex	*Number*	*Percentage*
Males	59	57.9 %
Females	43	42.1 %
Total	102	100.00%

$X^2 = (0\text{-}E) \cdot 0.5^2 = 1.032$ less than $X^2_{0.05} = 3.84$

A chi square showed no statistically significant difference between the affected males and females.

Symptomatology

The main symptoms observed in the order of frequency are enumerated in Table V. This line-up is about the same as that of 1966. Hyperpyrexia ranging from 39 to 40°C is the first complaint and this is alarming enough to make parents consult a physician or rush to a hospital. It is also an important guide in management and early warning of a severe form. Fever persists from 4 to 11 days or an average of 6 days. Abdominal pain is a disturbing symptom which could hardly be relieved by usual measures; fortunately the duration of pain is short, with a tendency to subside in 2 to 3 days.

Table V. Symptomatology of 102 Serologically Confirmed Dengue Cases Jan 1977 — April 1979

Symptoms	*Number of Cases*	*Percentage*
Fever	102	100
Abdominal pain	42	41.2
Epistaxis	33	32.4
Cough and colds	27	26.5
Vomiting	27	26.5
Restlessness	16	15.7
Headache	12	11.8
Hematemesis/melena	12	11.8
Other bleedings	10	9.8
Anorexia	8	7.8
Convulsion	3	2.9
Joint pains	3	2.9
Dyspnea	2	1.9

Physical Examination

The physical findings are enumerated in Table VI. Again the Tourniquet Test was the most consistent finding. At times this was negative on admission which changed, in a day or two, to a positive test. Violaceous rashes on the extremities were reported in 65% of the 1966 cases and 40% in 1977-79. Gross hemorrhages like hematemesis, melena, ecchymosis and subconjunctival hemorrhages were more frequently observed in 1966 than in the 1977-79 series. Bradycardia was usually noted during convalescence This did not seem to bother the patients and in a few days the heart rate returned to normal.

Table VI. Physical Findings of 102 Serologically Confirmed Dengue Cases
Jan 1977 — April 1979

Physical Findings	*Number of Cases*	*Percentage*
Positive Tourniquet Test	95	93.1
Petechiae	52	50.9
Rashes	41	40.1
Hepatomegaly	36	35.3
Cold extremities	30	29.4
Brodycardia	22	21.5
Pleural effusion	20	19.6
Lymphadenopathy	15	14.7
Purpura acchymosis	13	12.7
Arrhythmia	4	3.9
Abdominal distension		2.9

Two manifestations deserve mention. Hepatomegaly is a significant manifestation in Thai and other reports abroad, to the extent that it is included as one of four clinical criteria in the diagnosis of the disease. In the Philippines, the incidence is 12% for 1966 and 35% in the present study. Thai reports give an incidence of 90 to 96% hepatomegaly in children and 60% in adults. An apparent increase of hepatomegaly in the recent Philippine study may to some extent be due to increasing awareness of this finding, after frequent reports on its incidence in other countries. In fact it was remarked that hepatomegaly is observed during convalescence at which time liver palpation may be overlooked.

Again pleural effusion was not mentioned in the 1966 report though noted at postmortems in some Philippine cases. In the present study it was noted in 19.6% of the patients.

Severity

The WHO criteria of severity was availed of in this study, thus:

Grade I — Fever with no constitutional symptoms, the only hemorrhagic manifestation is tourniquet test (+)

Grade II — Additional manifestations to Grade I is spontaneous bleeding in skin and/or other hemorrhages

Dengue Hemorragic Fever

Dengue Shock Syndrome

Grade III — Circulatory failure manifested by rapid weak pulse, narrow pulse pressure (20mm Hg or less) or hypotension, cold clammy skin and restlessness

Grade IV — Profound shock with undetectable blood pressure and pulse

Accordingly the study group was classified by severity as shown in Table VII.

Table VII. Severity by WHO Criteria of 102 Serologically Positive Cases

Grade	*Number of Cases*	*Percentage*
I	17	16.7%
II	58	56.9
III	20	19.6
IV	7	6.9
Total	102	100.0

Blood Examinations

The leucocyte and differential counts, platelet count and hematocrit levels of serologically confirmed dengue patients are shown in Table VIII, IX, X and XI respectively.

Table VIII. White Blood Cell Count of 99 Serologically Confirmed Dengue Cases

WBC count	*Number*	*Percentage*
1 — 5,000/cu. mm.	40	40.4
5,001 — 10,000/cu mm.	51	51.5
10,001 — 15,000/cu mm.	7	7.2
15,001 — 20,000/cu mm.	1	1

Table IX. Differential Count of 102 Serologically Confirmed Dengue Cases

Differential Count	*Number of Cases*	*Percentage*
Neutrophilia more than 70%	31	30.3
Lymphocytosis more than 50%	40	39.2
Monocytosis more than 10%	10	9.8
Normal Differential Count	18	17.6

Results

Of 399 children admitted as dengue suspects. 259 had serological studies and of this number 61% were negative. Thus a total of 102 positive cases were included in the present study group.

Table I. HI Antibody Titers of Dengue Fever Suspects (Jan 1977 — April 1979)

Dengue Fever Suspects	399
Dengue Suspects with Serologic Tests	259
Serologically positive cases	102
Paired Blood Samples	55
Single Blood Samples	47

Monthly Incidence

The distribution of cases by month during the period of study is given in Table II. A high incidence was noted between July to November each year, with a peak in September and October.

Table II. Monthly Incidence

	1977	*1978*	*1979*	*Total*
January	1	1	1	3
February	4	0	0	4
March	2	0	1	3
April	1	0	1	2
May	0	0		0
June	3	0		3
July	3	8		11
August	6	8		14
September	4	13		17
October	9	18		27
November	4	11		15
December	2	1		3

Table X. Actual Platelet Count of 90 Serologically Confirmed Dengue Cases

Platelet Count	*Number of Cases*	*Percentage*
Less than 100,000m^3	8	8.8%
100,000 — 500,000m^3	24	26.6
500,001 — 1,000,000m^3	58	64.4

Platelet count was by indirect method.

Table XI. Hematocrit Levels of 67 Serologically Confirmed Dengue cases

Hematocrit level	*Number of Cases*	*Percentage*
less than 30 Vol. %	3	4.4%
30 — 35	6	8.9
36 — 40	17	25.3
41 — 45	25	37.3
46 — 50	7	10.4
over 50 vol. %	9	13.4

It will be noted that leucopenia was observed in 92% of cases with lymphocytosis in 39%. Low platelet counts (by indirect method) were obtained in only 8.8% of 90 cases. Hematocrit levels of 36 to 45 were noted in more than half of 67 patients. Serial platelet — hematocrit determinations were not done in this study.

Management

For Grades I to III symptomatic treatment was aimed at relieving the patients and making him comfortable. They were watched closely, particularly at the transition period from hyperpyrexia to apyrexia. Important manifestations watched for were indifference, or lethargy, anxiety, restlessness, cyanosis, coldness of extremities, together with the pulse and blood pressure.

Oral fluids were encouraged but when these were taken with hesitation, and coaxing, IV fluids were given particularly during continuous hyperpyrexia and increasing anorexia, a very helpful

measure even before evidences of impending shock started to set in.

For impending (Grade III) or actual (Grade IV) shock therapy consisted of IV fluids, plasma expander, and or steroids. Blood was administered only for massive bleeding. IV bicarbonate was given for acidosis. Oxygen was administered as needed.

Outcome

Of 102 patients in this study, 20 (19.6%) manifested impending shock (Grade III) and 7 (6.9%) went into shock (Grade IV). The management of the Grade IV or 7 shock cases was as follows:

3 received IV fluids + plasma expanders and steroid
2 received IV fluid + steroids
2 received IV fluids + plasma and subsequently also blood

No comparative study was made in this group due to the small number and the patients were not strictly comparable. There was only one death.

Summary and Conclusions

In order to determine trends in the clinical manifestations of dengue hemorrhagic fever, a study was made of 102 serologically proven dengue cases among children in Metro Manila from December 1977 to April 1979.

It is evident from this and other reports that the disease has become endemic and at low levels in Metro Manila

Of 399 dengue suspects, 102 cases (39%) were serologically positive for dengue infection.

The incidence by month gave September, October and November as the peak months with 5 to 9 years as the susceptible ages. There was no sex predilection noted.

Hyperpyrexia, abdominal pain and epistaxis were early and consistent manifestations. Hepatomegaly (35%) and pleural effusions (19%) were observed more frequently than in past reports, which were 12% and 0 in a 1966 report. Bradycardia was commonly observed during convalescence.

Approximately 90% were leucopenic with lymphocytosis of more than 50% in 39% of the cases. Low platelet counts occured in 8.8% of 90 cases. Hematocrit levels of 36 to 45 were noted in more than half of 67 patients.

By WHO criteria of severity, 20 or 19.6% were classified as Grade III (impending shock) and 7 or 6.9% as Grade IV (in shock). Of 102 cases, there was only one death.

Management was mainly symptomatic and intravenous fluids was the mainstay of therapy. There were not enough cases of impending or actual shock to carry out and compare different modalities of treatment.

HI Antibody of 102 Serologically Positive Cases

A. Single Samples

Name	*Age*	*Severity*	*Titer*
J.R.	5 years	I	1:640
O.S.	10 years	I	1:640
C.S.	9 years	I	1:1280
T.V.	7 years	I	1:1280
R.V.	14 years	I	1:1280
J.G.	12 years	I	1:1280
L.S.	5 years	I	1:1280
E.C.	15 years	I	1:640
R.Q.	14 years	I	1:1280
M.B.	6 years	I	1:1280
C.D.	4 years	I	1:1280
M.D.	3 years	II	1:640
R.S.	7 years	II	1:1280
L.C.	7 years	II	1:1280
M.M.	13 years	II	1:1280
A.C.	10 years	II	1:640
P.D.	9 years	II	1:1280
J.J.	7 years	II	1:1280
M.F.	3 years	II	1:1280
M.O.	12 years	II	1:1280
M.R.	8 years	II	1:1280
F.V.	11 years	II	1:1280
E.D.	5 years	II	1:1280
W.T.	10 years	II	1:1280
C.M.	2 years	II	1:1280
J.G.	10 years	II	1:1280
J.K.	7 years	II	1:1280
R.G.	4 years	II	1:1280
G.R.	11 years	II	1:1280
Y.R.	9 years	II	1:1280
M.A.	4 years	II	1:640
A.C.	6 years	II	1:1280
A.C.	3 years	II	1:1280
J.H.	5 years	II	1:1280
R.L.	6 years	II	1:1280
P.S.	10 years	II	1:1280
R.L.	9 years	III	1:1280
V.E.	8 years	III	1:1280

M.P.	6 years	III	1:1280
M.O.	9 years	III	1:1280
G.A.	7 years	III	1:1280
L.V.	6 years	III	1:1280
M.P	9 years	IV	1:640
M.C.	4 years	IV	1:1280
G.S.	9 years	I	1:1280
R.F.	10 years	I	1:1280
A.S.	10 years	II	1:1280

B. Paired Samples

Name	*Age*	*Severity*		*Titer*
E.J.	10 years	I	1:160	1:1280
R.I.	6 years	I	1:1280	1:1280
G.A.	8 years	I	1:80	1:1280
C.Z.	9 years	I	1:1280	1:1280
M.L.	7 years	II	1:1280	1:1280
D.C.	5 years	II	1:160	1:1280
R.O.	1 year	II	1:20	1:1280
R.P.	5 years	II	1:640	1:1280
N.M.	3 years	II	1:640	1:1280
D.H.	2 years	II	1:1280	1:1280
B.C.	5 years	II	1:1280	1:1280
D.D.	6 years	II	1:1280	1:1280
Y.W.	6 years	II	1:20	1:80
N.T.	9 years	II	1:1280	1:1280
D.G.	7 years	II	1:320	1:1280
L.P.	1 years	II	1:20	1:320
C.B.	5 years	II	1:20	1:1280
E.E.	8 years	II	1:80	1:1280
M.C.	5 years	II	1:640	1:1280
J.D.	3 years	II	20	1:320
D.A.	4 years	II	20	1:1280
D.C.	13 years	II	20	1:80
J.C.	8 years	II	1:1280	1:1280
C.T.	1 year	II	20	1:80
J.M.	4 years	II	1:160	1:1280
J.V.	11 years	II	1:80	1:1280
L.M.	3 years	II	1:80	1:1280
H.S.	9 years	II	1:20	1:320
M.P.	7 years	II	1:20	1:80
J.M.	10 years	II	1:1280	1:1280
J.D.	15 years	II	1:1280	1:1280
P.V.	1 years	I	1:20	1:80
R.M.	8 years	II	1:640	1:1280
V.V.	4 years	II	1:80	1:1280
M.A.	18 years	II	1:80	1:1280
M.V.	6 years	II	1:1280	1:1280
C.S.	5 years	II	1:20	1:80
C.M.	7 years	III	1:640	1:1280
R.L.	9 years	III	1:320	1:1280

G.R.	9 years	III	1:1280	1:1280
R.P.	8 years	III	1:1280	1:1280
G.P.	5 years	III	1:1280	1:1280
C.Q.	3 years	III	1:320	1:1280
D.B.	5 years	III	1:320	1:1280
M.C.	4 years	III	20	1:160
M.L.	5 years	III	1:1280	1:1280
M.H.	4 years	III	1:1280	1:1280
C.C.	6 years	III	1:1280	1:1280
W.A.	7 years	III	1:160	1:1280
P.P.	3 years	III	1:1280	1:1280
E.M.	8 years	IV	1:20	1:320
E.Z.	7 years	IV	1:1280	1:1280
S.C.	10 years	IV	1:1280	1:1280
R.S.	8 years	IV	1:160	1:1280
J.F.	5 mos.	I	1:20	1:80

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