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Review article

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Review on complete eradication of dengue virus

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ABSTRACT

Dengue is an endemic viral infection genome is 11kb long and encodes a single viral polyprotein is then cleaved in to three structural proteins the capsid (C) premembrane (PrM) and envelop (E) and seven non structural (NS) proteins NS1, NS2a, NS2b,NS3, NS4a, NS4b and NS5 that are found in infected host cells and are required for replication of virus. These proteins in the infected host produce severe Dengue fever as Dengue/DSS/DHF has to increase the mortality rate in every year mainly in the Asia and Pacific regions. The session of preventing the disease is characterized by eradication of mosquito and preparation of vaccine but up to that both the works are not effective. The present review hope to eradicate Dengue not vector our concentration based on who is act as an exact reservoir of virus may be the recovered person because we did not concentrate the complete elimination of virus from the patients

Keywords: Dengue, Envelop, Virus, Vector and Fever

INTRODUCTION

Dengue is a vector transmitted disease caused by any one of closely related dengue viruses (DEN1, DEN2, DEN3 & DEN4) .Transmitted to human by the bite of an infected mosquito, Aedes Aegypti and also Aedes Albopictus [1-3]. All four serotypes can cause full blown disease .Infection with one serotype is believed to produce lifelong immunity to that serotype, but they can be Infected with other serotypes in future [4, 5]. The humans are the primary host for dengue viruses .the virus spreads to the host tissues by the salivary gland from the gut of the mosquito the virus seems to have no detrimental effect on mosquito [6-8].

Dengue may also get transmitted via infected blood products and through organ donation and vertical transmission from mother to child. The serotype puts the individual at a greater risk to develop .Dengue Haemorrhagic fever (DHF) it increases vascular permeability, hypovolemia and abnormal blood clotting mechanisms [9, 10]. The DHF is a potentially deadly complication with dengue fever but after several days the patient becomes irritable, restless and sweaty and the dengue shock syndrome (DSS) is characterized by bleeding that may appear as tiny spots of blood on the skin [petechiae] and larger patches of blood under the skin [ecchymosis].

The Aedes aegypti and an A .albopictus are commonly known vector of dengue fever [11, 12]

these are breed both in man made (plant pots, tires, water jars etc), they are more cosmopolitan in their feeding habitats and rest both inside homes and outside and making control is more difficult.

EPIDEMOLOGY

The incidence of dengue is increased 30 fold between 1960 & 2010 .In India first outbreak was reported during 1963 in Kolkata .the next major outbreak of dengue/ DHF was reported in Delhi and neighboring states in 1996 data for the last 10 years reveals max number of cases due to Dengue [13-15] /DHF were reported in year 1996 (16,000) while the next increase was noted in year 2003 (12,000).

Dengue endemic countries in Asia eg. Thailand, Indonesia, vietman, srilanka, Myanmar and Maldives have good passive surveillance system for DHF but not for Dengue [16-17] which reflects the bulk of transmission.

THERAPETIC ACTIVITY

In any kind of treatment first step is diagnosis of the diseases depends [18] on the patient health.

Differential diagnosis

Which include influenza, enteroviral infection, measles and rubella .In appropriate epidemiologic settings malaria, leptospirosis and typhoid fever must also be considered.

Clinical diagnosis

To making provisional diagnosis such as positive tourniquet test, leukopenia thrombocytopenia and increases serum AST levels.

Laboratory testing

Conformation of acute dengue was characterized by serological test the following diagnostic approach to the patient with suspected dengue [19, 20] is recommended for laboratory testing.

An acute phase serum (or) plasma sample should be used to IgM immunoassay (MAC-ELSIA (or) equivalent) is the procedure of choice for rapid confirmation of the diagnosis.

To confirm a positive IgM assay result (or) if a patient with suspected dengue virus infection has

negative has IgM assay result a convalescent phase serum should be obtained at least 10-14 days after the acute phase serum

The acute and convalescent specimens should be analysed together by haemagglutination inhibition (HI) (or) enzyme immune assay to provide definitive serologic testing for acute dengue virus infection. Complement fixation and neutralizing antibody assays are more technically demanding are dyed in specialized laboratories only.

One assay than lan use single blood specimen for diagnosis of dengue infection is IgM antibody capsule Elisa {or} MAC-ELISA. This test is assist rapid diagnosis of infection and the sensitivity, specificity of this assay is much lower than the HI assay.

Serum {or} plasma are the preferred specimens for virus isolation, although virus can be isolated from liver tissues after clearance of virus from the serum, Reverse transcriptase-polymerase chain reaction {RT-PCR] used to viral isolation. Dengue viral proteins can be detected in tissue samples using immunohistochemical staining techniques.

Ultrasound also used to detect the plasma leakage in DHF. Plasma leakage occurred as early as three days after the onset of fever Treatment.

There is no specific therapy available for dengue virus infection. Supportive treatments are available for the specific disease manifestation of dengue virus infection, because of no specific therapy to treat the Dengue infection not possible to reduce the mortality rate throughout the world. The survey given (Figure 1) in the following data (Table 1).

Dengue fever

To maintain their intake at oral fluid to avoid dehydration. Fever and myalgia can be managed by the usage of Acetaminophen. Aspirin {or} non-steroidal anti-inflammatory agents should generally be avoided because of the risk of bleeding complications and in children because the potential risk of Reye's syndrome.

Dengue virus infection with significant Bleeding

Gastro intestinal bleeding {or} menorrhagia in patients with dengue fever can be severe enough to require blood transfusion

Dengue Hemorrhagic Fever

In mild cases, when medical attention is received early oral rehydration may be sufficient. Patients with established intra vascular fluid loss, intravenous fluid administration is recommended.

TREATMENT OF SHOCK

Patient with shock an initial bolus of 5 % dextrose in normal saline (or) Ringer's lactate (10-20 ml per kgs of body weight) infusion rapidly is recommended followed by continuous infusion (10-20 ml per hour) until viral signs and urine output

normalise. The infusion rate can be gradually reduced until it matches plasma losses. The adequacy of fluid repletion should be assessed by serial determination of haematocrit, blood pressure pulse and urine output .Excessive fluid administration after normal signs can cause hypervolemia and pulmonary edema.

Unusual complications

Encephalopathy and liver failure are uncommon manifestations of DHF which are associated with a high mortality rate. Treatment response shown in: Figure 1

Cases and Deaths due to Dengue in India
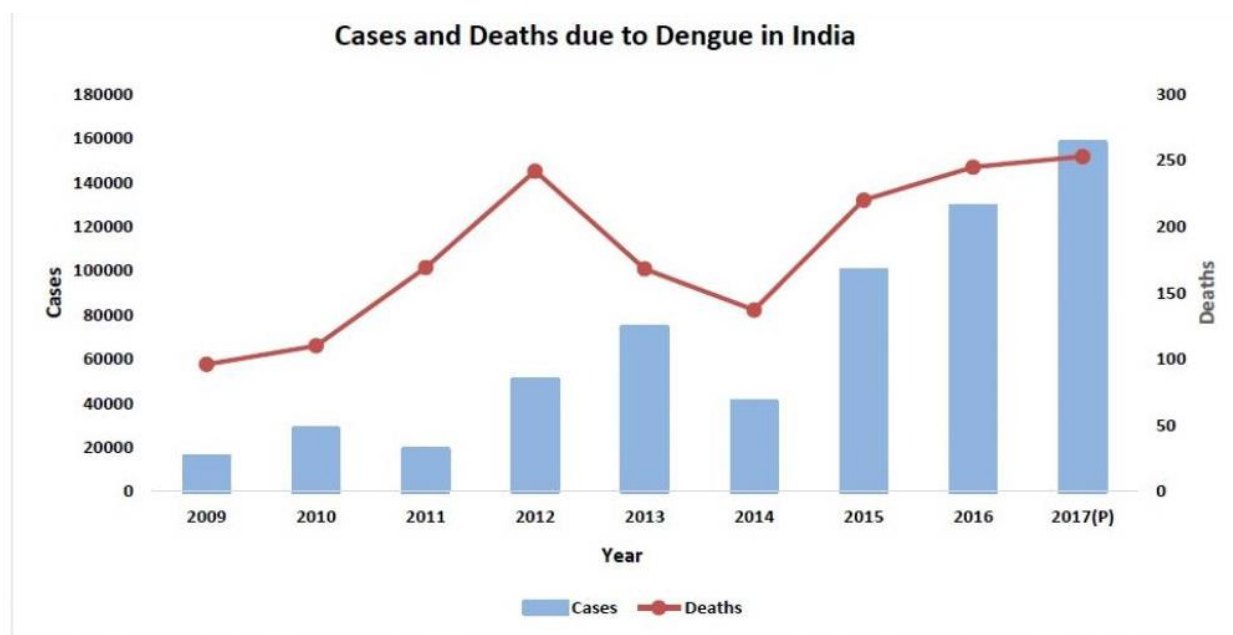
Source: Directorate of National Vector Borne Disease Control Programme, Dte.GHS, Ministry of Health & Family Welfare

Diseases spreading rate (Table 1)

3.1.5 State/UT wise Cases and Deaths Due to Dengue in India, 2013 - 2017(P) (ICD - 10 Code A90 - A91)

S. No.	State/UT	2013 Cases	2013 Deaths	2014 Cases	2014 Deaths	2015 Cases	2015 Deaths	2016 Cases	2016 Deaths	2017(P) Cases	2017(P) Deaths
1	Andhra Pradesh	910	1	1262	5	3159	2	3417	2	4844	0
2	Arunachal Pradesh	0	0	27	0	1933	1	13	0	15	0
3	Assam	4526	2	85	0	1076	1	6157	4	5024	2
4	Bihar	1246	5	297	0	1771	0	1912	0	1875	0
5	Chhattisgarh	83	2	440	9	384	1	356	0	433	0
6	Goa	198	2	168	1	293	0	150	0	235	0
7	Gujarat	6272	15	2320	3	5590	9	8028	14	4632	5
8	Haryana	1784	5	214	2	9921	13	2493	0	4413	1
9	Himachal Pradesh	89	2	2	0	19	1	322	0	453	0
10	J&K	1837	3	1	0	153	0	79	1	485	0
11	Jharkhand	161	0	36	0	102	0	414	1	707	5
12	Karnataka	6408	12	3358	2	5077	9	6083	8	17265	5
13	Kerala	7938	29	2575	11	4075	25	7439	13	19973	37
14	Madhya Pradesh	1255	9	2131	13	2108	8	3150	12	2585	6
15	Maharashtra	5610	48	8573	54	4936	23	6792	33	7442	41
16	Manipur	9	0	0	0	52	0	51	1	187	1
17	Meghalaya	43	0	0	0	13	0	172	0	42	0
18	Mizoram	7	0	19	0	43	0	580	0	107	0
19	Nagaland	0	0	0	0	21	1	142	0	357	0
20	Odisha	7132	6	6433	9	2450	2	8380	11	4158	6
21	Punjab	4117	25	472	8	14128	18	10439	15	15320	0
22	Rajasthan	4413	10	1243	7	4043	7	5292	16	8387	16
23	Sikkim	38	0	5	0	21	0	82	0	659	0
24	Tamil Nadu	6122	0	2804	3	4535	12	2531	5	23294	65
25	Telangana*	-	-	704	1	1831	2	4037	4	3083	-
26	Tripura	8	0	6	0	40	0	102	0	123	0
27	Uttarakhand	54	0	106	0	1655	1	2146	4	971	0
28	Uttar Pradesh	1414	5	200	0	2892	9	15033	42	3066	28
29	West Bengal	5920	6	3934	4	8516	14	22865	45	10697	19
30	A&N Islands	67	0	139	0	153	0	92	0	17	0
31	Chandigarh	107	0	13	0	966	1	1246	0	1094	0
32	D & N Haveli	190	0	641	1	1154	0	4161	2	1996	0
33	Daman & Diu	61	0	46	0	165	0	89	0	59	0
34	Delhi	5574	6	995	3	15867	60	4431	10	9232	9
35	Lakshadweep	0	0	0	0	0	0	0	0	0	0
36	Puducherry	2215	0	1322	1	771	0	490	2	4766	7
	All India Total	75808	193	40571	137	99913	220	129166	245	157996	253

ERADICATION

Mosquito control

Is the most effective approach to the prevention of dengue transmission. Lack of attention and funding of programs in 1970s led to reemengence of A.ageypti and corresponding emergence of dengue.

Vaccination

Infection with dengue provides long term protection against the particular serotype not (or) only short lived immunity to other three dengue serotypes.

Recommendations for travellers

Most travellers from non-endemic countries are exceeding low risk for DHF because they lack previous exposure.

Conclusions

There are number of works were cited above as in world side. The number of diseases management programmes were developed and educated to the public and to take the number of prevention measures to reduce the mortality by dengue /DHF/DSS out of this vector control but in most places has not resulted in sustainable reduction in disease incidence has indicated in figure2.
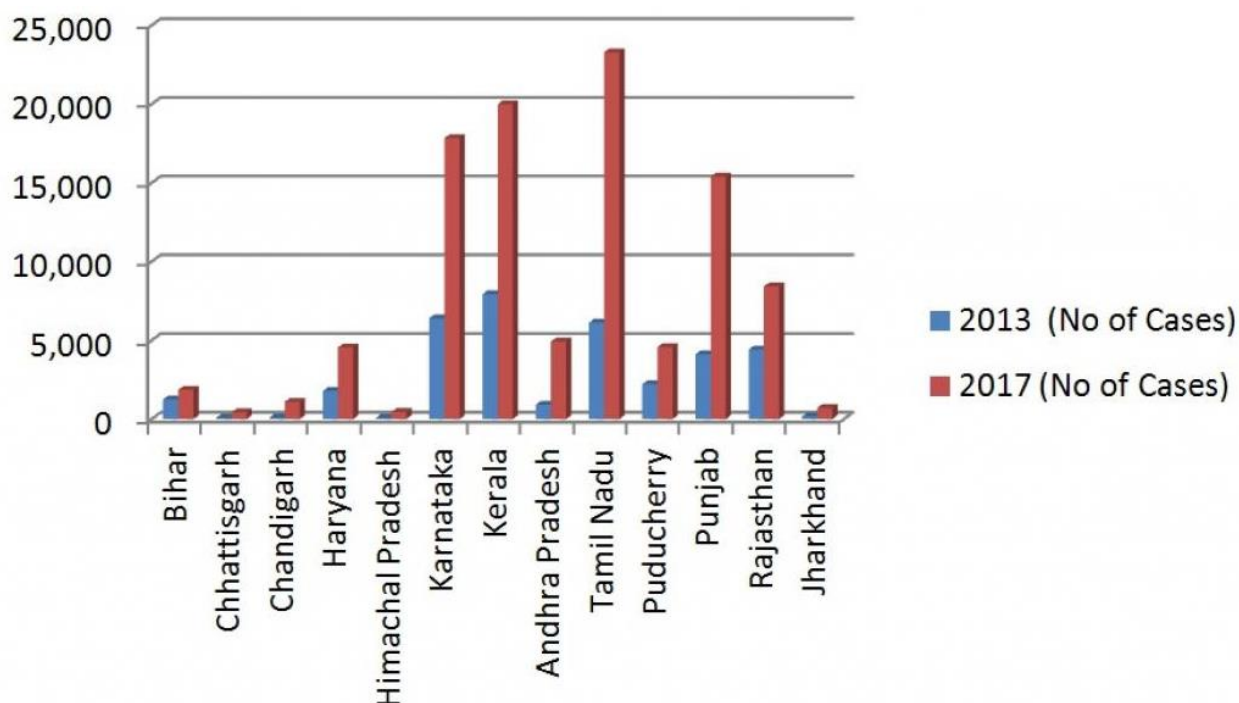
Study was made on the genetic nature of dengue virus and its immunogenic nature to the primary host of human being but intra-gost genetic diversity of DEN1 may emerging a problem to develop vaccine.

Development of antiviral drugs towards the different types of virus proteins can be reviving by combination therapy is not much more effective as like HIV and HCV.

Finally using the resolution enabled by next generation sequencing {NGS} technologies also not effective because of intra -host viral population diversity variation in the Dengue genome in A acgyptis and A albopictus and legions of constraint within the viral genome that are refractory to variation in both human and mosquito.

So Lack of approval vaccines and antiviral of prevention and treatment of the disease and failure of vector control give indications going to control the availability of reservoirs of human beings. Which are recovered from the disease? Because we are not making any test to complete eradication of virus from the patient. As like mosquito the human being may have the tolerance due to modification of their genotype {or} phenotype.

Already we know certain climate conditions only virus can enumerate the infection, may be the climate conditions act as an inducer for the reproduction of virus in the reservoirs. So we will make more concentration towards the eradication of available reservoir and prevent the multiplication of virus by their self but not the control of vector which will reduce the dengue incidence which helps to safe the public in future.

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