

Dengue : How do we manage

The year 2022 has seen an unprecedented peak of Vector Borne Diseases mainly Dengue and Malaria. Going by unconfirmed reports in Print Media number of cases in West Bengal crossed 20000 on first October and 924 cases have been diagnosed on that day. Some valuable lives have already been lost due to Dengue. Not only Urban but Semi-urban and rural areas are also reporting patients.

Dengue is an age-old disease with recurrent outbreaks occurring every three to five years. Last two years have witnessed an unprecedented pandemic of COVID-19 when social and economic activities almost came to a halt. All other diseases were also seen less frequently. As we were slowly recovering from the impact of COVID-19 the old villain has struck with much vengeance.

Dengue is transmitted by female Aedes mosquitoes which bite classically in the early morning and late afternoon. The mosquitoes breed in very small collections of clean water including left over Plastic Cups, Buckets, Tubs, Old Tyres, Discarded Shoes, Flowerpots, Brick Hole, Roof Guttering etc. After biting an infective Dengue patient (patients remain infectious for mosquito from onset of fever to up to five to six days) the mosquito becomes infectious after 8 to 12 days. This mosquito is now ready to transmit infection. After bite by an infected mosquito a susceptible person develops Dengue illness after an incubation period of 5 to 7 days (range 3 to 10 days). Classically three stages are seen : Febrile, Critical and Convalescent stages. Most of the time the illness is a mild and self-limiting while around five percent of patients develop complications.

There are mainly four serotypes of Dengue virus. Infection by one serotype (known as primary infection) leads to lifelong immunity against the strain and a short-lasting immunity (for about three months) against the other strains. After three months, one can again be infected by other serotype (secondary infection) which can be quite serious.

Two main pathological changes occur in Dengue namely, plasma leakage and Thrombocytopenia. Due to increased capillary permeability fluids come out of intravascular space causing pleural effusion and ascites. In extreme cases, this may lead to hypotension and shock. There is also progressive thrombocytopenia and sometimes it may lead to minor (Purpura, Epistaxis, Nose/gum bleed) or very occasionally major haemorrhages (Gastrointestinal/Vaginal etc). Besides haemorrhages, complications may set in many organs of the body eg, Liver, Kidney, Heart, Brain, Pancreas etc. collectively known as Expanded Dengue syndrome.

Classical Dengue patients complain of Fever, Headache, Retro Orbital Pain, Arthralgia, Nausea, Vomiting etc. There may be an initial blanching rash appearing after two to three days of illness. The fever usually does not last for more than five to six days. There may be a late diffuse erythematous rash with white areas in between

(white island in sea of red) in some patients. Some patients may complain of itchy rash in late stage. When fever remits a small percentage of the patients go on to develop complications. Classical warning signs are severe pain abdomen, repeated vomiting, extreme weakness, difficulty in breathing, passing very low volume of urine, bleeding from some area etc. Very young children, elderly people, pregnant women, people with serious underlying Liver, Kidney, Heart Diseases, Metabolic Diseases, immunosuppressed conditions, malignancies etc are at special risk to develop complications.

Diagnosis of Dengue is made by demonstration of NS1 antigen (non-structural protein) in first five days and IgM dengue antibody after five days of illness, both by ELISA methods. IgG antibody is not routinely tested, when present, it indicates secondary dengue. Rapid tests may give false positive or negative results and are to be discarded. Malaria must be tested for in all cases of acute onset fever. Complete haemogram shows progressive leukopenia followed by thrombocytopenia. Special attention is to be paid to Packed Cell Volume (PCV) /Haematocrit. Normally PCV is three times of Haemoglobin. In unstable patients a high PCV: platelet ratio indicates ongoing plasma leakage whereas a low ratio may suggest internal haemorrhage. So, in unstable patients, monitoring of Hb, PCV and platelets must be repeated at least twice daily. Liver Function Test shows SGOT(AST) more than SGPT(ALT). Besides there may be evidence of other organ dysfunctions. USG may show features of pericholecystic oedema, ascites, pleural effusion etc.

Most of the patients can be managed at home with advice for taking adequate oral fluids (ORS water, Fruit Juice, Coconut water, Plain water etc) and administration of Paracetamol as necessary (usually not more than 3 grams per day for an adult). Those with warning signs or high-risk patients need to be admitted. IV fluids are to be administered for those who are unable to take adequate fluids orally or those with dehydration. Crystalloids (normal saline, Ringer's lactate etc.) are usually administered. In patients with hypotension IV fluids are initiated in jet followed by reduced rates when patients tend to stabilise haemodynamically. Colloids are infused in refractory hypotension. IV fluids are usually not necessary beyond 24 to 48 hours. Platelet transfusion is given in case of major bleeding along with transfusion of packed red blood cells. Prophylactic platelet transfusion is given in patients with platelet count less than 10,000/ cu mm even in absence of any bleeding. However, recent evidence is accumulating against prophylactic platelet

transfusion. Unnecessary platelet transfusion should be avoided at all costs. Supportive treatment is given for any other organ dysfunction. There is no recommendation for steroids, Carica papaya (pepe) leaf tablets etc. Patients are discharged when they are afebrile for at least 48 hours, not needing any support and platelet count shows a rising trend, at least more than 50000/cu mm.

Usually, Dengue fever does not last beyond five or six days. In patients with persistent fever other causes like Malaria, Typhoid, Scrub Typhus, Leptospirosis, Secondary Bacterial Infection etc, need to be excluded. Rarely in a patient where other causes of fever have been excluded and with persistent cytopenia, jaundice with raised liver enzymes, raised ferritin, triglyceride etc. macrophage activation syndrome has to be considered. They are to be managed with steroids.

Available Dengue vaccines have limitations and have not yet been approved for India. Trials are on way for other vaccines. The most practical way to prevent Dengue till now is to prevent breeding of mosquitoes which needs concerted efforts from civil (Municipal/ Panchayat) and public health departments. But none will succeed unless there is appreciation among public regarding their duty towards not offering breeding places to mosquitoes by throwing things here and there. Those who need to store water must clean water reservoirs in houses at least once a week with thorough scrubbing of walls of the emptied containers.

To conclude, the menace of Dengue is going to be there for few more months this year till the temperature goes down consistently below 20°C when breeding of mosquitoes will automatically decrease. Suspicion regarding Dengue in all patients with fever should be high in the mind of physicians. NS1 antigen in first five days and IgM antibody by ELISA method thereafter gives the diagnosis. Malaria must be excluded in all cases of fever. Possibility of COVID-19 is to be kept at mind. There is progressive leukopenia followed by Thrombocytopenia in Dengue. Correlation between Hb and PCV gives an idea about Plasma leakage and need for fluids. Most patients can be managed at home with adequate oral fluids and paracetamol as necessary. High risk patients or those with warning signs need admission. Fluids are the mainstay for management. Platelet or other blood products are needed less often. Supportive treatment is needed for any other organ dysfunction. The morbidity can be brought down to great extent and mortality to almost zero level if management is done as per standard protocol.

MBBS, DTM&H, MD (Tropical Medicine)
Professor and Head
Department of Infectious Diseases and Advanced Microbiology,
School of Tropical Medicine, Kolkata 700073

Bibhuti Saha