

Leading Article

Dengue Menace 2019 Dhaka: A Closer Look

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Dengue fever (DF) including its severe forms (dengue haemorrhagic fever and dengue shock syndrome) has become an important public health concerns. Over the past two to three decades there has been a dramatic increase in the incidence of DF, dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS).¹

At the beginning of the century, that is, the year 2000, we first faced the dengue fever in Dhaka. It was a devastating year for us. Even now I can remember the faces of so many innocent children and their grieving parents. Despite all our efforts, we had failed to save a number of children we treated. We could not bring them back from the shock and could only continue to hopelessly put in effort. A big part of that effort included antibiotic therapy along with platelet and blood transfusion. We learned later that all three procedures were unnecessary and somewhat harmful. We were not at all equipped to handle dengue at that time.

From the beginning of the next year, 2001, through government initiative and the assistance of the WHO, we began the process of establishing training programmes and guidelines aimed to efficiently combat dengue. We studied dengue thoroughly. We also learned about the different management protocols for dengue patients. We learned about the differences between Classical Dengue Fever, Hemorrhaging Dengue Fever, and Dengue Shock Syndrome, and began to adopt the ideal fluid management process. We learned that fluid management was the cornerstone of dengue treatment.² Antibiotics and steroids played no role at all in helping dengue patients (with very few exceptions). We therefore avoided these and started to teach our students the ideal dengue management protocols. By that time we came to know that documented cases of serologically proven dengue

fever occurred in Dhaka city in 1964, which was known as "Dacca fever".^{3,4} Since then dengue fever occurred sporadically in Bangladesh, but prevalence was very low.

During the following years we learned lot more about Dengue disease. Quite a number of children with classical dengue fever, dengue hemorrhagic fever and dengue shock syndrome visited us. They were all managed efficiently. Following 17 years (up to 2017), the trend was almost similar. During monsoon and post monsoon season we used to be prepared for managing dengue cases.

From 2000 to 2002, every year Bangladesh experienced episodes of dengue fever with all four serotypes, but predominant serotype was DENV-3.⁵ After 2002, no DENV-3 or DENV-4 was reported from Bangladesh. Up to 2016 DENV-2 followed by DENV-1 was present in the circulation. But in the year 2017, re emergence of DENV-3 was faced in the circulation and subsequently there was very high incidence of dengue fever in the year 2018 during the monsoon season.⁶

But we faced a disaster this year (2019). We were neither prepared nor equipped to fight this war situation. According to Director General Health Service (DGHS) health emergency and control room source (November 30, 2019),⁷ more than one lac Dengue patients were treated in different hospitals of the country in 2019 which was more than double the total number (50,181) in last 19 years (2000-2018). Fortunately enough we fought the war very successfully. Particularly among children population, we had no or very minimum casualty. Rather than only successfully, we can say that we won the war.

This victory was possible because of the very prompt and combined initiatives and efforts made by Govt. of Bangladesh through Ministry of Health and family Welfare, Directorate General of Health Services office, different hospital administrations, Bangladesh Medical Association, Bangladesh Society of Medicine, Bangladesh Paediatric Association and

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many others. Ministry of Health & Family Welfare has taken commendable initiatives to train the doctors, nurses and other Health workers across the country for management of dengue cases. All the public hospitals expanded their beds and formed "Dengue Management cells" to accommodate and manage dengue cases efficiently. Government of Bangladesh also procured and ensured dengue diagnostic kits at free of cost at public sectors and minimum rate at private sectors.

But I must salute and acknowledge our doctors, nurses, technicians and other health professionals for their relentless hard work. They worked day and night. They did not have any rest any day including, Eid, Puja, Friday or any other holiday. While serving Dengue patients, six of our medical doctors and a few nurses died of dengue. I pay my homage and prayers to them and their family.

While managing a child with dengue fever we should always remember some important issues:

Children are more prone to develop dengue than adults. At the same time they can have dengue shock syndrome (DSS) very quickly and if not treated promptly and effectively, mortality rate is also very high. The reasons behind these are the differences of children from adults. Some of the physiological differences are:⁸

- Water content of body is much higher in a child than that of an adult.
- Proportion of extracellular fluid volume is more than intracellular fluid volume in children.
- Body surface area in a child is relatively more than an adult.
- Metabolic rate is much higher in children than in adults.

Vital signs including pulse, blood pressure and respiratory rate also differ in children according to age. Young infants also have less respiratory reserves and are more susceptible to liver impairment and electrolyte imbalance. They may have a shorter duration of plasma leakage but usually respond quickly to fluid resuscitation.¹ Infants should, therefore, be evaluated more frequently for oral intake and urine output.

While measuring blood pressure in a child, one must remember that cuff size should be appropriate for a child. Definition of pulse pressure is also different in

a child. These important issues should always be kept in mind while assessing and monitoring a child with dengue. We have a very good and effective Dengue management guideline prepared by CDC, DGHS⁹. If we follow the guideline and closely monitor the child, the outcome should be very good. The most important part is fluid management.

The amount of fluid a child needs always depends upon the weight and condition of the child. The type of fluid the child requires is also dependent upon the condition. Fluid calculation for a child should be very meticulous and drop per minute is to be adjusted very accurately. Fluid needs to be increased or decreased according to the condition of the child.

More than 700 children were admitted in the Dengue cell and paediatric ward in Bangabandhu Sheikh Mujib Medical University (BSMMU) in this year (2019). Out of them almost half was admitted with the warning signs and around 60 children was admitted with DSS. Our experiences show that, presentation of dengue cases this year were different. Unlike high fever, headache, eye pain or body ache (which were the typical features of Dengue in the previous years), many children had low grade fever associated with loose motion or vomiting and went into shock rapidly. That is why we also had to have very high index of suspicion for diagnosis. On the other hand, guardians of the child became panicked and investigated their child even without any doctors' advice.

Unfortunately, almost all the children with dengue shock syndrome had been referred to us from different hospitals and clinic of the country and the cause of shock was inappropriate fluid management. In some cases there was incorrect fluid calculation in respect of rate and volume, and some were getting inappropriate fluid. For example, in most of the cases, hypotonic saline (dextrose in aqua) was infused. In the guideline, it is recommended to start the management with normal saline (isotonic saline) from the very beginning.

Multi-organ involvement in dengue is well established, especially hepatitis and renal involvement. This time we got some other complications like myocarditis, encephalitis and pancreatitis. Besides, we found 4 children with macrophage activation syndrome. We have faced a few more challenges like dengue with co-morbidities, for example children having blood cancer, pneumonia or thalassaemia. We had to treat these children very carefully.

But, it is a matter of great pleasure that, till date, all the children admitted into dengue cell or inpatient department of general paediatrics in BSMMU had come round completely and went back home. And this was possible only for the tireless hard work, dedication and devotion of all the physicians, nurses and other health workers assigned there. Our teachers, consultants and many residents worked hard relentlessly with parental affection to serve the paediatric dengue patients (paediatricians should always try to manage the children with this attitude).

In fact, all the physicians and health workers all over the country worked very hard to fight against dengue, and that is why we have won this war. Now, this is the time to start fighting a new war. That is prevention and control of dengue.

Prevention of dengue in Bangladesh cannot be successfully done solely by Government effort. It needs effective co-ordinated efforts by multiple ministries and agencies including Ministry of Health and Family Welfare, Ministry of Local Government, Ministry of Environment, City Corporation/ Municipalities and other Non-Govt. Agencies. Most importantly public awareness and participation are needed for effective control of dengue. As dengue is now considered an endemic disease in the country, control programmes including vector control should be carried out throughout the year. We hope we will also win this war very soon.

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