

## ORIGINAL ARTICLE

## Dengue 2019 – A change in perspective of clinical presentations and laboratory finding

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### Abstract:

*Dengue is known primarily to be a disease of the monsoon season, and following that a post monsoon disease. Fever along with rash, myalgia and headaches were very typical of the disease. However, since 2014, these trends have been changing in Bangladesh, with cases being reported in the premonsoon season. This cross sectional observational study was carried out from January 2019 to July 2019 at Holy Family Red Crescent Medical College Hospital. 100 hundred patients who were serologically positive either by Dengue NS1 antigen or by Dengue IgM antibody were conveniently taken in the study and their features and investigations (laboratory and ultrasonography) were noted. These findings were also compared with 100 dengue patients who were studied in 2013 in the same institute. Changes in the presenting features were noted; while fever was found to be present 100% in both years, aches and pains were prominently less in 2019 as compared to 2013 (headache, retro orbital pain, backache 23% vs 90%; 3% vs 45%; 1% vs 48% respectively). Rashes and itching were also found to be less in 2019 as compared to 2013 (4% vs 16%; 1% vs 30% respectively). On the other hand, gastrointestinal symptoms like nausea and vomiting were more in 2019 (51% vs 30% respectively). Similarly, on imaging, there appeared to be more evidence of plasma leakage as seen with ascites, pleural effusion and thickened gallbladder compared to 2013; leucopenia was noted to be less in 2019 (45% vs 60%), but thrombocytopenia < 50,000/L was more in 2019 (49% vs 25%). Although the patients reflect a small section of society, it is quite evident that there is a shift in the pattern of dengue presentation, both in their features and imaging.*

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### Introduction:

Dengue is the most important arboviral disease present at the moment. Around 50 million dengue infections occur every year, with an estimated 2.5 billion people living in dengue endemic countries<sup>1</sup>. Over the last few years the change in its season predilection along with presentation has

come to notice. Primarily being a disease of the monsoon and post monsoon period<sup>2</sup>, this year it has also been witnessed in the winter seasons too and beginning of the year. Changes in climate which have effect on the vectors, namely *Aedes aegypti* and *albopictus*, changes in urbanization and the virus itself have led to a variation in the presentation of the disease<sup>3</sup>.

Humidity, rise in temperature and urbanization has led to changes in the climate factor. With more overcrowding and poor hygiene practices this disease has now become rampant. The virus and vector were initially thought to be urban residents; however, with more people travelling these viruses have now spread to the rural areas. In certain cases, there appear to be more rural cases of dengue than urban.<sup>4</sup>

Dengue was traditionally known as saddle backed break bone fever with rash. With change in climate, vector and virus the clinical manifestations have also changed. Recently from 2016 it has been noticed that rash has been a less marked feature, on the other hand or pharyngitis, gastrointestinal symptoms appear to be more prominent.<sup>5</sup>

This time around there has been an increase in the number of cases of dengue haemorrhagic fever, simple classical dengue seems to be less. Most of the patients have ultrasound findings of ascites, pleural effusion and gall bladder wall oedema. The study of 2019 is compared to a similar study that was carried out in the same institute in 2013.<sup>6</sup>

**Materials and method:**

This was a cross sectional observational study on patients admitted to Holy Family Red Crescent Medical College Hospital between January 2019 and July 2019. Patients were diagnosed based on either Dengue NS1 Antigen or Dengue IgM Antibody. History from clinically suspect patients was taken meticulously and was then followed by laboratory investigations and ultrasonography when required. Patients who fulfilled the inclusion criteria of being serologically positive (either NS1 antigen or Dengue IgM antibody) were enrolled in this study. Informed consent was taken from the patients. The establishment of each patient as dengue fever, dengue hemorrhagic syndrome, dengue shock syndrome, dengue expanded syndrome was based on the latest national dengue guidelines issued by the World Health Organization.

**Results:**

The 100 dengue patients of 2019 were compared against the 100 dengue patients of 2013 that were studied in the same institute. Demography, clinical features, laboratory investigations and imaging were compared between the two years.

Among the 100 patients studied, 64 were male, while there were 54 males in the 2013 study. Table 1 shows that fever was found to be present 100% in both years, however, there is a shift in the pattern of aches and pains. These were prominently less in 2019 as compared to 2013 (headache, retro orbital pain, backache 23% vs 90%; 3% vs 45%; 1% vs 48% respectively). Rashes and itching were also found to be less in 2019 as compared to 2013 (4% vs 16%; 1% vs 30% respectively). On the other hand, gastrointestinal symptoms like nausea and vomiting were more in 2019 (51% vs 30% respectively). Respiratory symptoms were noted in 2019, these were not mentioned in the 2013 study. Table II shows that leucopenia was noted to be less in 2019 (45% vs 60%), but thrombocytopenia < 50,000/L was more in 2019 (49% vs 25%). Table III finds that imaging reports were only available for 80 patients in 2019; there appeared to be more evidence of plasma leakage as seen with ascites, pleural effusion and thickened gall bladder compared to 2013. 16.25% patients had ascites in 2019 compared to 10% in 2013; nearly 18% of pleural effusion and gall bladder wall thickening were reported in 2019; these findings were not noted in 2013.

**Table I:** Symptoms and signs of dengue patients

| Symptoms and Signs | Number of patients 2013 (n=100) | Number of patients 2019 (n=100) | Symptoms and Signs      | Number of patients 2013 (n=100) | Number of patients 2019 (n=100) |
|--------------------|---------------------------------|---------------------------------|-------------------------|---------------------------------|---------------------------------|
| Fever              | 100                             | 100                             | Bleeding manifestations | 2                               | 6                               |
| Headache           | 90                              | 23                              | Skin rash               | 16                              | 4                               |
| Retro orbital pain | 45                              | 03                              | Cough                   | -                               | 9                               |
| Bodyache           | 56                              | 39                              | Dyspnoea                | -                               | 2                               |
| Backache           | 48                              | 01                              | Joint Pain              | -                               | 2                               |
| Nausea/ Vomiting   | 30                              | 51                              | Generalised Itching     | 30                              | 1                               |
| Diarrhoea          | 20                              | 14                              | Anorexia                | -                               | 6                               |
| Constipation       | 62                              | 01                              |                         |                                 |                                 |

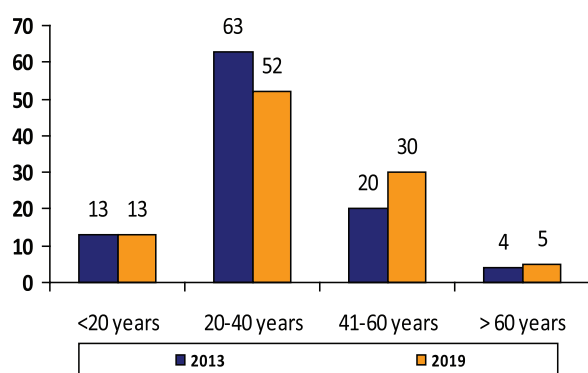
**Table II:** Total WBC, platelet count and liver function in 2013 and 2019

| Investigation                | Number of patients 2013 (n=100) | Number of patients 2019 (n=100) |
|------------------------------|---------------------------------|---------------------------------|
| Leucopenia                   | 60                              | 45                              |
| Platelet count               |                                 |                                 |
| <10 x 10 <sup>9</sup> /L     | 0                               | 2                               |
| 10-50 x 10 <sup>9</sup> /L   | 25                              | 49                              |
| 51-100 x 10 <sup>9</sup> /L  | 32                              | 23                              |
| 100-150 x 10 <sup>9</sup> /L | 27                              | 12                              |
| >150 x 10 <sup>9</sup> /L    | 16                              | 14                              |
| HCT >20% rise                | 28                              | 15                              |
| SGOT (raised)                | 89                              | 28                              |

**Table III:** Ultrasound findings of the Abdomen

| Feature                     | Number of patients 2013 (n=100) | Percentage | Number of patients 2019 (n=80) | Percentage |
|-----------------------------|---------------------------------|------------|--------------------------------|------------|
| Hepatomegaly                | 31                              | 31%        | 6                              | 7.5%       |
| Splenomegaly                | 24                              | 24%        | 4                              | 5%         |
| Hepatosplenomegaly          | -                               | -          | 3                              | 3.75%      |
| Ascites                     | 10                              | 10%        | 13                             | 16.25%     |
| Pleural effusion            | -                               | -          | 14                             | 17.5%      |
| Thickened Gall bladder wall | -                               | -          | 13                             | 16.25%     |
| Prominent spleen            | -                               | -          | 2                              | 2.5%       |
| Mild fatty liver            | -                               | -          | 3                              | 3.75%      |
| Cholelithiasis              | -                               | -          | 1                              | 1.25%      |
| Normal                      | -                               | -          | 20                             | 25%        |

**Fig. 1:** Comparative age distribution of patients in 2013 and 2019



None of the patients in the 2013 study received any steroids, platelet or blood transfusion; however, in 2019, 18 patients received steroid, 5 received platelet transfusion, and one received whole blood.

**Discussion:**

The comparison between the two studies does show evidence of a paradigm shift in not only clinical features but also investigations.

Out of the 100 patients studied in 2019, the ratio of male to female was 1.7:1, which was near about the same found in the 2013 dengue study done at the same institute. This partially reflects the studies from the South East Asia region which suggests a higher ratio of males than females in DF/DHF hospitalized cases (India, Bangladesh, Malaysia and Singapore) and only a few studies which show no differences between the sexes.<sup>7,8,9</sup>

What used to be regarded as disease primarily of children, has now spread to the adult population. In the first DHF outbreak in Bangladesh, the age group of 18-33 years was the most affected<sup>9</sup>. Our study showed the majority of the patients to belong to the 20-40 years age group.

The major change noted between the two studies is seen in the clinical presentation. In 2019 there appeared to be less of classical dengue symptoms. This change has been noted by Islam QT in his 2018 report on the changing dengue pattern in Bangladesh; there appeared to be less of the classical symptoms such as break bone fever and rash, but more of gastrointestinal features such as nausea and vomiting<sup>5</sup>. Although the article mentions that more leucopenia as a special observation in the changing pattern, our study found less leucopenia compared to the 2013 study. However, more thrombocytopenia (<50000/L) was noted in 2019.

Our study found the presence of ascites, pleural effusion and gall bladder wall thickness to be nearly the same; organomegaly was less evident. This has also been seen in the study by Manam et al, where gall bladder thickness was the most common finding (65.08%) followed by pleural effusion (49.21%)<sup>10</sup>.

This has been also seen in the past few decades in dengue ultrasound literature<sup>11,12,13</sup>. In the 2013 study, this was only noted in the form of ascites, as there was no available data on the presence of pleural effusion or gall bladder wall thickness.

There were certain limitations in the study. As this was carried out in a tertiary hospital, the true picture of the population could not be assessed. The patients had to finance their own investigations, hence, some blood tests and ultrasounds often had to be foregone.

### Conclusion:

The paradigm changes in dengue with regards to its season preference, regional distribution and presentation reflects the magnitude of the power of urbanization on one hand and viral genotype and increased virulence on the other. While we humans have no control over the latter, we definitely have a hand in the former. Although mortality has become nearly nonexistent due to the more efficient care and management of dengue patients in our parts of the world, it only takes a mutation to change a serotype that may have devastating consequences in the future.

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