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EDITORIAL

RECENT TREND IN DENGUE IN BANGLADESH

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Bangladesh is facing the onslaught of Dengue infection in 2023 with an impact of huge mortality and morbidity. Although dengue is an endemic disease in Bangladesh since 2020 with few thousand of admitted reported case and low case fatality rate (CFR), there has been few epidemics in between these long endemicity. The 2000, 2002, 2019, 2022 are the years where we observed epidemic situation with large number of cases and increased CFR.(Health emergency and operation control room report, DGHS)[1]This year seems to be heading towards breaking all the previous records in this respect. In 2023, we are observing hundreds of cases since January with occasional death but from June, the scenario changes abruptly due to unusual hot and humid condition of climate changes and followed by premature rainfall leading to stagnant water source on the background of unplanned urbanization and huge infrastructure development around Bangladesh.

The fig 1 showed the current reporting of dengue syndrome from DGHS (10th August 2023) where it is seen the admitted patients in June, July and upto 10th august is 5956, 43854 and 26196 with increasing

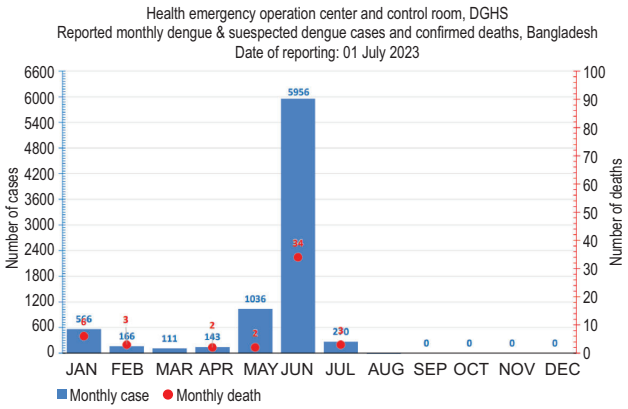

Fig 1: *The 2023 dengue report from MIS, DGHS showing month wise cases and death*

mortality. This year already 78028 patients were admitted in different health facility in Bangladesh with total mortality of 364. Although initially it was observed as Dhaka Metropolitan city is having highest case loads but later it was seen that spread of disease outside Dhaka become a predominant challenge. Currently there is almost half cases in Dhaka city and half outside of this city. Among the admitted case, 87% patients get discharged from hospital while CFR is 0.5% which is high above the national average death of 0.1% for last 20 years with an average 10000 patients admitted in a day around Bangladesh. Among the admitted cases, 67% is male, around 49% are within age group of 16-40 years and 44% of death is also observed in the age group of 16-40 years indicating the onslaught of this deadly virus among the active young generation[2].(Dengue 2023 Report — HEOC & CR, MIS, DGHS). The Fig 2 shows the month wise distribution is having raising trends and year wise there is variability of epidemic potentials due to covid 19 intervene and post covid consistent rising trends.

Although there are far more cases who are not captured within the report system, this trend is observed only in admitted cases (who are reporting) in public and private hospitals. Although dengue is a notifiable disease, the reports are not deriving from cent percent hospitals or facilities. The Dhaka city is providing report from 20 public facilities and 57 private facilities where 23350 cases with 208 death (CFR 0.89%)were observed in public facility while the privates have 16561 cases with 75 death(CFR 0.45%).This indicates the extreme burden in public facility with bizzare emergency system and hence raised mortality while the private system is also running very busy exhausting schedule of dengue patients with raised mortality. The outside of Dhakametropolitan city is even frustrating as few private facility is reporting while the capture from public facility is almost cent percent. The 38117 cases

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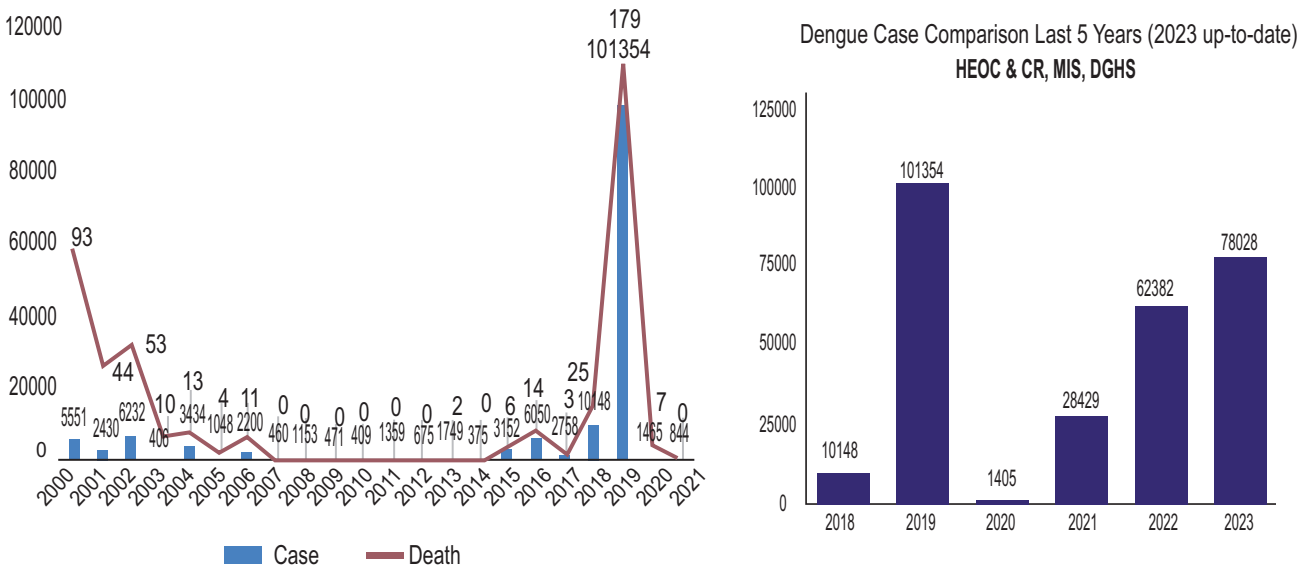

Fig.-2: *The dengue trends of morbidity and mortality from 200-2021 and comparison of last 5 years*

from outside Dhaka metropolitan city is having 81 death(CFR 0.21%) which is far low than Dhaka metropolitan city.

The raising trends of mortality and morbidity may have many reasons. There is also changing pattern of dengue syndrome that has been observed for last few years (2018 is the year where paradism was starting to shift).In 2018, the dengue outbreak was characterized by predominant

gastrointestinal symptoms (more than 60%) and 17.6% with hypotensionin adult cases[3]. Since then every year typical as well as atypical presentation in dengue was observed frequently in outbreak conditions. In 2019, Gastrointestinal(GI) features, including anorexia and/or vomiting (69.4%), abdominal pain (39.8%) and diarrhoea (25.6%), were more prevalent than typical rash and pain symptoms. Hypotension was present in approximately one-quarterof patients (25.4%)[4]. A decade analysis of dengue in Bangladesh revealed the changing trends of clinical features in dengue syndrome. Thrombo-cytopeniawas present in 66.1% of cases. Fever (100%) was common for all. Gastrointestinal (GIT) features, includingabdominal pain (86.5%), anorexia and/or vomiting (69.6%), and Diarrhea (>3 motions/day) (26.2%) were morefrequent than typical rash and other pain symptoms. Hypotension was present in approximately a quarter of patients(25%).[5] GIT features (anorexia, nausea, and/or vomiting) and hypotension were more common among adult participantswhile bleeding manifestation (melena and vaginal bleeding, p = 0.009 & 0.032) was more frequent in pediatricpatients. Compared to outbreaks of 2008, 2016, and 2018, increasing trends in GIT symptoms e.g. anorexia, abdominalpain, and diarrhea were observed. While a negative trend in hemorrhagic manifestations (skin rash, melena, and conjunctival hemorrhage/hemorrhagic sclera) and arthralgia/joint pain were found[5]. There was variation in mortality within this time frame also. Since 1998 to 2002, the CFR was 1.38% while the intervention by CDC, DGHS leads to decline mortality to 0.66% in 2000-2017 but since then, there is again raising of mortality observed (2018-2023). In last 20 years the mortality was more in male while in 2023 upto august, female fatality was observed more[1,2,5]. It was observed that 70% death happens within 24hours of hospital admission which is alarming and perhaps indicating the delay of admission by patients perspective and lack of quality emergency management system in Bangladesh especially in public hospitals.[2,5] It has been observed that there is a tendency in the private facilities to avoid the occurrence of any deaths to maintain their reputation and hence they refer more complicated cases to the public facilities to minimize the impact on their reputation. The Expanded dengue syndrome is also taking its role to show the atypical presentation of dengue since the transition of clinical entity observed since 2017.A 32 patients case series in one private hospital revealed 13 hepatitis n others, 9 myocarditis and others, 5 pancreatitis and others and 3 AKI.[6] In 2023, there is more description of encephalitis than previous years (Personal communication)

The epidemiology of DF/DHF is complex and remains poorly understood. It involves host, viral and vector status that are further influenced by demographic, economic, behavioural and varied societal factors. Epidemiologic transition was observed in 2014 when the seasonal variation was started to shift from purely monsoon based illness to endemic status. From 2000-2014, the seasonal rainfall and post rain season was responsible for 98% cases but since 2014, the intermittent rainfall at pre- monsoon pick up the trends at pre-seasonal cases which is augmented by poor urbanization and developmental work.[7] Climate changes starts to show its effect since 2014 as well as a strong and significant correlation with humidity and positive dengue cases ($p < 0.001$) and also showed a significant correlation with low and medium rainfall ($p<0.039$)[7].The climate information showed that the average rainfall, humidity, and temperature were comparatively higher in 2015–2017 than that of the previous years and this year 2023 the highest temperature and humidity was observed. These changes are an important niche to develop mutation in dengue virus and hence the burden of morbidity and mortality. Every year the CDC, DGHS perform the entomological survey at premonsoon. Monsson and post mosoon period and which clearly shows trends of shifting the season from July to October to all season. While the plastic drums (15%), buckets (15%), flower

tubs and trays (2%), and water tanks (0.77%) were commonly seen as outdoor or indoor reservoir of larva,[7] there is now new places like roof garden, the garage water lane where the density is even found more for *Aedes aygeptii.* The new area involves including the periurban and rural territory for dengue cases is marking fingers to *Aedes Albopictus* which may remain abundant in rural areas. The entomological survey at different region with exploration on *Aedes albopictus* is time demanding issue now.

The serotype of DEN 1 to DEN 4 were observed at different time in Bangladesh and also mixed or more than 2 serotype in same season was also seen. In 2019, when Largest dengue outbreak of the decade in Bangladesh history (more than 100000 admitted case) was seenwith high fatality may be due to reemergence of DEN-3 serotype in Dhaka, Bangladesh, necessitating immediate public health attention[8]. The presence of multi serotype and switch over to one predominant serotype to other may be an important reason to change the paradismshift to rural spread, seasonality and climate variability. Besides, Socio cultural and socio economic factors affecting vector longevity and survival is also an important reason. Studies in Thailand have revealed the following quantum of DHF risk with different sequences of dengue viruses with DENV 1/ DENV 2: 500 fold,DENV 3/DENV 2: 150 fold , DENV 4/DENV 2 equals to 50 fold risk. We need to explore similar viral genotype affecting time interval between sequential infections in Bangladesh.

Integrated vector management and important public health measurement is crucial to contain and control the dengue infection in a country. There is gross need of whole society and whole governement approach in multisectoral pathway to alleviate this serious public health issue in Bangladesh. The lack of coordination, inter- ministerial conflicts, peoples non-engagement, lack of community participation etc all are creating a non viable environment to control dengue in Bangladesh. A year through continued sustainable integrated vector and environmental management is the key to success for preventing the onslaught of dengue. Research contextualizing Bangladesh situation of dengue viruses with genotype and phenotype exploration, vector bionomics, the clinical situation, the epidemiology, the critical case management, death audit, the environmental niche, the vector containment innovation strategy (BTI, Woolbachiaetc), the vaccine and medicine trials etc are needed to develop evidence based policy for dengue control in Bangladesh. We must all realize that "Dengue is one disease entity with different clinical presentation and often with unpredictable clinical evolution and outcome."

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