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Dengue Fever and COVID-19 Co-Infection; A Threat to Public Health for Co-epidemic in Pakistan

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To the Editor,

The rapid expansion of COVID-19 has caused around 16 million confirmed cases with approximately 0.65 million deaths worldwide. Recently with the

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geographical spread of COVID-19 and more involvement of adults, there have been increasing reports of co-infections with various other infectious diseases. During the on-going pandemic where health authorities are primarily engaged to contain the infection, any other infectious disease outbreak will hinder the manoeuvres combating COVID-19 and will create the diagnostic challenges for healthcare professionals. According to a recent estimate, Pakistan ranks 12th globally with 0.27 million cases along with 5865 deaths till July 28, 2020 [1]. Recently, National Institute of Health (NIH) in Pakistan issued 'High Alert' for dengue viral infection (DVI) as monsoon season (July – December) is considered a vulnerable period for dengue spread [2]. This alert poses critical and logistic challenges for overwhelmed and under-resourced healthcare system of Pakistan. A timely and stern action plan is need of hour and must be implemented in haste to quell the increasing risks of co-infection.

Dengue virus is transmitted to humans by the female Aedes mosquito (*Aedes aegypti)*. From January 2014 to May 2020, Pakistan has reported 99,264 laboratory confirmed cases in almost all four major provinces of the country. Epidemiological data from last five years indicate that Pakistan has experienced major outbreaks from July to December with peak onset observed in October. In 2019, approximately twenty-five thousand cases were reported and possibly same pattern is expected this year. Currently, monsoon season has already started in Pakistan with record rainfall. Moreover, cases of COVID-19 is expected to surge due to the recent increase in mobility and social interactions during Eid-ul-Adha, an annual religious festival in the country. On the other hand, poor sanitation system is facilitating the habitat for Aedes mosquitos [2]. This chronological coincidence indicates a co-epidemic of COVID-19 and DVI. Keeping in view the fragile healthcare system and economic turmoil in Pakistan, dengue outbreak will pose serious challenges for which country is not

readily prepared [3]. As timely and stern measures can curb the situation, we felt inclined to share few suggestions in this regard.

Recent studies show that majority of the symptomatic COVID-19 patients present with fever, cough and headache, and some have also presented with fever only [4]. Available literature on dengue demonstrates that these patients present with fever and sometimes headache [5]. Skin rash, a cardinal feature of DVI, has also been observed in COVID-19 patients [6]. Moreover, both DVI and COVID-19 share similar laboratory features [7]. Keeping in view the high similarity between two infections and increased workload on healthcare professionals, the propensity of misdiagnosis is substantially high. It must be noted that both infections progress differently. In this context, the differential diagnosis is of utmost importance during the era of pandemic. As both viral diseases portend substantial morbidity and mortality if timely management is not initiated, misdiagnosis of any disease may deteriorate the patient`s conditions and portend additional burden on healthcare system.

Few cases have been observed in Singapore where patients were initially tested negative for DVI but later hospitalized due to persistent fever and final diagnosis revealed co-infection with dengue and SARS-CoV-2 [8]. Two cases of co-infection have also been reported Bangladesh, resulting in death in one patient [9]. Another case of co-infection associated death has been reported in India [10]. In Thailand, a patient who presented with petechial rashes was treated as dengue case but declared as co-infected with COVID-19 following advanced clinical diagnosis [6].

Keeping in view the complex scenario of outbreaks, the under resourced healthcare system in Pakistan is at risk of drastic collapse with increasing socio-

economic concerns. We suggest, appropriate measures be taken to discriminate patients with appropriate diagnosis.

We suggest few precautionary measures in addition to the already established guidelines to take in account during the COVID-19 pandemic by the health authorities in Pakistan. Effective and timely vector control measures such as prioritise spraying in high risk areas, public awareness on clinical manifestations of DVI and methods for prevention of mosquitoes infestation should be considered immediately. Patients presenting to healthcare professionals with fever, rash, headache and respiratory problems must be subjected to DVI and COVID-19 diagnosis. Moreover, these patients should be treated in a parallel way such as fluid replacement therapy for DIV and specific drugs for COVID-19. All the hospitals must consider preparing the treatment guidelines and algorithm for suspected cases as a component emergency preparedness. Laboratory testing facilities must be increased such as antibodies testing and polymerase chain reaction (PCR). Since medication shortage has been reported during the pandemic, drug regulatory authorities should focus their efforts to ensure the availability of essential medicines, particularly in dengue hotspots. Since both infections require isolation wards in hospitals, health authorities should arrange necessary space. Since co-infected patients are source of both infections, an isolated ward must be established for these patients. The district and provisional authorities should develop SOPs of water management for timely cleaning of road and places to avoid any stagnant water and government should provide funds to authorities.

Conflict of Interest

All authors declare no conflict of interest.

Author`s Contribution:

MHB, AA, THM conceptualize the work; MHB, AA, SM drafted the work; THM, YHK revised the manuscript; All authors give final approval for publication of the content.

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