FROM CRISIS TO CONTROL: NAVIGATING THE DENGUE CHALLENGE

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Given the current state of medical research and the ongoing threat posed by vector-borne illnesses, a multisectoral collaboration using one health approach is needed to bolster our resistance to these dangerous adversaries. Dengue Fever, a vector-borne disease, continues to cast its shadow across communities worldwide, posing a significant threat to public health. Dengue also known as bone-break fever is a viral illness that spread from mosquitoes (Aedes aegypti and Aedes albopictus) to human beings. This virus has four different serotypes namely DENV-1,2,3,4. While DENV frequently results in an acute flu-like illness, a significant portion of infections lead to mild illness with over 80% of cases exhibiting no symptoms. Sequential infection increases the risk of severe dengue. Immunization to one serotype does not offer cross immunity to other serotypes.

Recent years have witnessed a staggering surge in Dengue cases with an estimate of 96 million symptomatic cases and about 40,000 deaths annually in over 129 countries, according to WHO.[1] Pakistan is home to the endemic Dengue fever, which is transmitted throughout the year with seasonal peaks. Initially dengue fever was documented to have occurred in 1994, however a sharp increase in incidence and the yearly epidemic trend started in November 2005 in Karachi.[2] The worst flooding in the history of Pakistan has further increased the number of reported dengue cases in 2022 between January and September as compared to previous four years. As per the National Institute of Health, the country has documented a cumulative of 25,932 confirmed cases with reported 62 deaths. About 74% of the cases were recorded in the month of September alone. As of September 22, province wise distribution was available for 83% (21777 cases) of the total, revealing that 32% (6888 cases) were documented in Sindh and 29%(6255 cases) in Punjab(including Islamabad Capital Territory),[3] followed by Khyber Pakhtunkhwa and Balochistan. A recent data collected by European Centre for Disease Prevention and Control indicated that case notification per 100,000 population in Pakistan remained below100 during December 2022 to November 2023.[4]

Since there is no particular cure for dengue, prompt case identification, spotting any early warning signs of a severe infection, and efficient management of cases are essential components of patient care that can reduce the mortality rate of severe infections to less than 1%. To mitigate the control of dengue vector, Pakistan's Emergency Plan of Action (EPoA), Dengue Response is presently being implemented. By distributing long-lasting insecticidal nets (LLINs), mosquito repellent, spraying, and fumigating mosquito breeding places; this initiative seeks to minimize the spread of transmission of vector and establish preventative measures among susceptible populations by increasing community awareness.[5] Furthermore, Ministry of Health in collaboration of global funds has initiated a Vector Management Program to dengue virus. This comprehensive approach involves weekly technical committee meetings led by Ministry of Health and establishment of dengue

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counters in all health facilities.[6]

Pakistan has enormous challenges in its fight against mosquito-borne illness, chiefly brought on by its climate, urbanization, and low public knowledge.[7] In order to successfully address these issues and lessen the effects of dengue and malaria epidemics, implementation of comprehensive solutions that include targeted public health education initiatives, climate-responsive vector control, and urban design considerations must be taken.

A ray of optimism is provided by recent breakthroughs despite the obstacles in control of dengue. Faster and more precise diagnosis of Dengue infections is made possible by modern diagnostic technology including advanced imaging and quick testing. The development and introduction of Dengue vaccines, together with the historic approval of several formulations, represents a major advancement in prophylactic care. A live recombinant tetra valent dengue vaccine (CYD-TDV) has been developed to be used in seropositive individuals after pre-vaccination screening of the individual for serum IgG antibodies against dengue. This vaccine is licensed for use in 20 countries and given as three dose series of 0,6 and 12 months to individuals aged 9-45 years residing in the dengue endemic areas. Moreover, 5 more vaccine are under trial with 2 vaccines in phase 3 of clinical trial and showing promising results. In this scenario, it is hard to deny that preventive strategies will see a radical transition in the coming time by introduction of vaccine against dengue.

It is the need of the moment to realize the importance of one health approach and take appropriate steps in accordance with the principles of primary health care using inter-sectoral collaboration of all the government as well as private organizations working in synchronization along with active community participation to achieve a common cause- the control of Dengue.

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