

## The role of Vitamin D in management of the Dengue fever

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*Dear Madam,* Dengue fever is a rapidly spreading mosquito-borne viral infection that predominantly affects tropical and subtropical regions worldwide. It is estimated that over 390 million people globally are at risk of contracting dengue infection.<sup>1</sup> Moreover, the mode of transmission of dengue virus is primarily by the bite of infected female mosquitoes of *Aedes aegypti*. Dengue can manifest in a broad range of symptoms, from mild Dengue fever to more severe conditions like Dengue haemorrhagic syndrome (DHS), with Dengue shock syndrome (DSS) being the most critical form.

Pakistan has recently experienced a surge in dengue cases, with the National Institute of Health reporting 79,007 in 2022, three times higher than the previous decade's figures. Notably, Sindh leads with the greatest number of cases (32%) followed by Punjab including Islamabad (29%), Khyber Pakhtunkhwa (25%), and Balochistan (14%).<sup>2</sup>

Currently, there are no clinically approved antiviral treatments available for dengue infection. Management primarily focuses on supportive care, including the administration of acetaminophen to control fever, adequate hydration and rest to manage symptoms. Platelet transfusions are advised when platelet counts fall below critical thresholds. However, there is growing interest of researchers in exploring novel treatments to reduce the duration of DENV infection and improve patient outcomes.

Recent studies have focussed on exploring the potential impact of vitamin D supplementation in the management of dengue fever. Vitamin D is known to have an immunomodulatory effect on the body. Studies suggest that Vitamin D alters the immune response against the DENV and halts its RNA replication, and decreases the production of pro-inflammatory cytokines (such as TNF- $\alpha$ , IL-6, IL-1), and promotes the production of anti-inflammatory cytokines like IL-10.

A study conducted in Colombia found that supplementing dengue patients with 4000 IU of vitamin D effectively

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suppressed viral replication and promoted an anti-inflammatory immune response.<sup>3</sup> Another clinical trial published in the Journal of Rawalpindi Medical College (JRMC) in 2017 demonstrated that administering 200,000 IU of Vitamin D significantly reduced the risk of DSS development in dengue patients (RR=0.058).<sup>4</sup> In contrast to the above findings, a few studies have yielded conflicting results—higher levels of 25OHD were associated with an increased risk of severe DENV infection, while lower levels appeared to reduce the likelihood of progression to DHS or DSS.<sup>5</sup>

Unfortunately, Pakistan faces a significant health burden during the annual dengue season. Given the rising number of cases, it is essential to further investigate the role of vitamin D in current treatment protocols. As vitamin D is inexpensive, priced at 270 rupees per dose, widely available and generally safe drug. Large-scale clinical trials should be conducted to assess its effectiveness in dengue management. Government should allocate more budget to research work to reduce the strain on the health care system. Conclusively, further research into this area could lead to improved patient outcomes and reduced healthcare costs.

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