Opinion
Volume 16: 01, 2025

Journal of AIDS & Clinical Research

ISSN: 2155-6113 Open Access

Cytomegalovirus Presence Complicates the Vaccine Response in People with HIV

Alina Gori*

Department of Medical and Surgical Sciences, University of Bologna, 40126 Bologna, Italy

Introduction

Human Immunodeficiency Virus has been a major global health concern since its identification in the early 1980s, significantly impairing immune function and increasing susceptibility to infections and diseases. Despite the significant advancements in antiretroviral therapy that have transformed HIV from a fatal condition to a manageable chronic disease, challenges remain in the management of individuals with HIV, particularly regarding their immune responses to vaccinations. One of the complexities in this area is the presence of co-infections, such as Cytomegalovirus, which can further complicate immune responses in individuals living with HIV. Cytomegalovirus, a member of the herpesvirus family, is another viral infection that affects a substantial portion of individuals with HIV. CMV is highly prevalent, with an estimated 60–90% of adults worldwide having been infected with the virus by the time they reach adulthood. In people with HIV, CMV can become reactivated due to the compromised immune system, leading to severe complications such as retinitis, gastrointestinal disease, and even systemic involvement of other organs [1-3].

Description

CMV, though typically asymptomatic in people with healthy immune systems, can significantly affect immune responses in individuals with HIV. It has been demonstrated that CMV infection can alter the balance of immune cell populations and skew immune responses, which complicates vaccination outcomes. One of the key mechanisms through which CMV affects immunity is by inducing immune system dysregulation. Chronic CMV infection leads to the accumulation of CMV-specific memory T cells, a process known as immune "scarring." These CMV-specific T cells, though necessary for fighting off reactivation of the virus, often become highly differentiated and exhausted, meaning they lose their ability to respond to new pathogens or vaccines. In people with HIV, CMV infection can further exacerbate this immune dysfunction. The presence of CMV reactivation in individuals with HIV can lead to an overrepresentation of CMV-specific T cells at the expense of a broader, more diverse immune response. This phenomenon limits the ability of the immune system to respond to other pathogens, including those targeted by vaccines. As a result, individuals with HIV and active or chronic CMV infection may have reduced vaccine efficacy, especially for vaccines that require a robust cellular immune response. Moreover, CMV can also influence the humoral immune response, which is primarily mediated by B cells and antibodies. B cell function in people with HIV can already be impaired due to the HIV infection itself, and the additional burden of CMV can further disrupt the proper activation and differentiation of B cells. This can lead to suboptimal antibody production following vaccination, further complicating the immune response to vaccines such as the ones used for measles, mumps, rubella (MMR), and influenza [4,5].

***Address for Correspondence:** Alina Gori, Department of Medical and Surgical Sciences, University of Bologna, 40126 Bologna, Italy, E-mail: goria@gmail.com*

Received: 01 February, 2025, Manuscript No. jar-25-163596; **Editor Assigned**: 05 February, 2025, PreQC No. P-163596; **Reviewed**: 15 February, 2025, QC No. Q-163596; **Revised**: 21 February, 2025, Manuscript No. R-163596; **Published**: 28 February, 2025, DOI: 10.37421/2155-6113.2025.16.1041

Conclusion

The presence of CMV in individuals with HIV presents a unique challenge to vaccination efforts. CMV-induced immune dysregulation interferes with both the cellular and humoral immune responses, limiting the effectiveness of vaccines in this population. While ART and other interventions can improve vaccine responses, individuals with HIV and CMV co-infection may still experience suboptimal protection. Understanding the interactions between HIV, CMV, and the immune system is crucial for developing strategies that enhance vaccination efficacy and ultimately improve health outcomes for people living with HIV.

Acknowledgement

None.

Conflict of Interest

None.

References

1. Hall, Deborah A., Alberto R. Ramos, Jeffrey Marc Gelfand and Aleksand er Videnovic, et al. "The state of clinical research in neurology." Neurology 90 (2018): e1347-e1354.
2. Meador, Kimford J. "Decline of clinical research in academic medical centers." *Neurology* 85 (2015): 1171-1176.
3. Chetlen, Alison L., Andrew J. Degnan, Mark Guelfguat and Brent Griffith, et al. "Radiology research funding: current state and future opportunities." *Acad Radiol* 25 (2018): 26-39.
4. Kearney, Anna, Nicola L. Harman, Anna Rosala-Hallas and Claire Beecher, et al. "Development of an online resource for recruitment research in clinical trials to organise and map current literature." *Clinical Trials* 15 (2018): 533-542.
5. Seufferlein, Thomas and Guido Adler. "Klinische forschung in deutschland am Beispiel der onkologie." *Oncol Res Treat* 33 (2010): 1-5.

How to cite this article: Gori, Alina. "Cytomegalovirus Presence Complicates the Vaccine Response in People with HIV." *J AIDS Clin Res* 16 (2025): 1041.