frontiers | Frontiers in Immunology

ORIGINAL RESEARCH
published: 22 April 2022
doi: 10.3389/fimmu.2022.878630

miRNA Profile Based on ART Delay in Vertically Infected HIV-1 Youths Is Associated With Inflammatory Biomarkers and Activation and Maturation Immune Levels

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Early antiretroviral treatment (ART) in vertically acquired HIV-1-infection is associated with a rapid viral suppression, small HIV-1 reservoir, reduced morbimortality and preserved immune functions. We investigated the miRNA profile from vertically acquired HIV-1-infected young adults based on ART initiation delay and its association with the immune system activation. Using a microRNA panel and multiparametric flow cytometry, miRNome profile obtained from peripheral blood mononuclear cells and its association with adaptive and innate immune components were studied on vertically HIV-1-infected young adults who started ART early (EARLY, 0-53 weeks after birth) and later (LATE, 120-300 weeks). miR-1248 and miR-155-5p, were significantly upregulated in EARLY group compared with LATE group, while miR-501-3p, miR-548d-5p, miR-18a-3p and miR-296-5p were significantly downregulated in EARLY treated group of patients. Strong correlations were obtained between miRNAs levels and soluble biochemical biomarkers and immunological parameters including CD4 T-cell count and maturation by CD69 expression on CD4 T-cells and activation by HLA-DR on CD16^{high} NK cell subsets for miR-1248 and miR-155-5p. In this preliminary study, a distinct miRNA signature discriminates early treated HIV-1-infected young adults. The role of those miRNAs target genes in the modulation of HIV-1 replication and latency may reveal new host signaling pathways that could be manipulated in antiviral strategies. Correlations between miRNAs levels and inflammatory and immunological markers highlight those miRNAs as potential biomarkers for immune inflammation and activation in HIV-1-infected young adults who initiated a late ART.

Keywords: miRNA profile, vertically acquired-HIV-1 infection, ART, youths, inflammatory profile

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Edited by:
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Specialty section:
This article was submitted to Viral Immunology, a section of the journal Frontiers in Immunology

Received: *18 February 2022*
Accepted: *23 March 2022*
Published: *22 April 2022*

Citation:
Tarancon-Diez L, Consuegra I, Vazquez-Alejo E, Ramos-Ruiz R, Ramos JT, Navarro ML and Muñoz-Fernández MA (2022) miRNA Profile Based on ART Delay in Vertically Infected HIV-1 Youths Is Associated With Inflammatory Biomarkers and Activation and Maturation Immune Levels. Front. Immunol. 13:878630. doi: 10.3389/fimmu.2022.878630