BIOCHEMICAL AND METABOLIC CHARACTERIZATION OF BONE MINERAL DYSFUNCTION IN PEOPLE LIVING WITH HIV

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The Human Immunodeficiency Virus (HIV), identified in the early 1980s, is a retrovirus of the Retroviridae family, of the Lentivirinae subfamily, and of the Lentivirus genus. Its main characteristic is that it has RNA as its genetic material, together with the reverse transcriptase enzyme, which transforms the viral RNA into cDNA, integrating into the DNA of the infected cell and initiating the viral cycle. The structure of HIV includes membrane glycoproteins such as gp120 and gp41, essential for cell invasion. Internally, it contains the p17 protein, crucial for HIV replication, while the capsid formed by the p24 protein protects the viral genome. The viral tropism of HIV is directed to CD4+ T lymphocytes, cells essential for innate and adaptive immune responses. According to UNAIDS, 39 million people worldwide live with HIV, 37 million of whom are adults, and 53% of these adults are women. In Brazil, an increase in AIDS detection rates was observed in ten states, with particular emphasis on Amazonas and Pará. Antiretroviral Therapy (ART) is a scientific advance in the treatment of HIV/AIDS, combining drugs to prevent the replication cycle of the virus, improving immune function and life expectancy of patients. However, prolonged use of ART can cause toxic effects and metabolic disorders, including loss of bone mineral density (BMD) and osteoporosis, common among people living with HIV/AIDS (PLWHA). These individuals suffer from accelerated bone loss, possibly exacerbated by ART, which can inhibit osteoblastic activity and promote bone resorption. Bone mass loss is also associated with other factors such as poor nutrition, tobacco consumption, low levels of vitamin D, and body composition. The study in question investigated the biochemical and metabolic profile of PLWHA, recruiting 50 individuals over 40 years of age. Of these, 48 underwent bone densitometry examinations, classifying 12 as normal, 23 as osteopenia, and 13 as osteoporosis. It was observed that age is a preponderant factor for bone loss. Biochemical analyses revealed that elevated levels of LDL, glycated hemoglobin, and glucose were common, while vitamin D was frequently below normal, especially in individuals with osteopenia. In hematological terms, significant differences were observed in red blood cells and hematocrit, although within the reference values. Parameters such as Mean Platelet Volume (MPV) and Platelet Distribution Width (PDW) indicated morphological alterations of platelets, associated with inflammatory states. Chronic inflammation and prolonged use of ART are critical factors for bone health in PLWHA. The study concluded that the biochemical and metabolic alterations observed are directly related to bone mass loss in PLWHA. The identification of biochemical markers associated with bone mineral dysfunction is essential for the evaluation and adequate management of these patients, highlighting the need for continuous monitoring and targeted therapeutic interventions to mitigate the adverse effects of ART and improve the quality of life of PLWHA.

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