A LITERATURE REVIEW ON RENAL AND BONE TOXICITY INDUCED BY TENOFOVIR

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INTRODUCTION: Tenofovir is a widely used antiretroviral medication for the treatment of human immunodeficiency virus (HIV) and hepatitis B infections. Although highly effective, its use is associated with adverse effects that require careful monitoring, especially regarding renal and bone toxicities. OBJECTIVE: This literature review aims to analyze the main adverse effects of tenofovir, highlighting the underlying mechanisms and strategies for clinical management. MATERIAL AND METHODS: This literature review was conducted based on scientific articles published between 2010 and 2025 focusing on tenofovir-related toxicity and adverse effects. Both forms of the drug - tenofovir disoproxil fumarate (TDF) and tenofovir alafenamide (TAF) - were included. The search was carried out in the PubMed and SciELO databases using keywords such as "tenofovir toxicity," "adverse effects of tenofovir," "renal toxicity tenofovir," and "bone toxicity tenofovir". Inclusion criteria focused on clinical trials, systematic reviews, and randomized controlled trials that discussed renal and bone toxicity in particular. RESULTS AND CONCLUSION: TDF is activated in the liver and kidneys and reaches higher extracellular concentrations, which can damage mitochondria in renal cells. This form has been linked to toxic effects like Fanconi syndrome, acute kidney injury, and proximal renal tubular dysfunction. Clinical studies have shown higher rates of nephrotoxicity among patients with risk factors such as diabetes mellitus, especially with long-term therapy. In contrast, TAF, which is activated intracellularly, results in lower renal concentrations and shows reduced nephrotoxic potential. Furthermore, TDF is also associated with a higher risk of reduced bone mineral density and osteoporosis, leading to increased fracture rates over time - particularly in individuals with comorbidities. TAF, in comparison, has a lower impact on bone density, making it a more favorable long-term option. Although renal and bone toxicities are the most extensively studied, tenofovir may also cause gastrointestinal symptoms like nausea and diarrhea, as well as lipid profile changes. Effective management includes regular monitoring of kidney function and bone density, along with therapeutic adjustments when necessary. These challenges require a tailored approach, ensuring treatment efficacy and long-term safety based on each patient's specific needs.

KEYWORDS: Antiretroviral therapy; Tenofovir disoproxil fumarate; Tenofovir alafenamide.