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No Histological and Biochemical Changes Following Administration of Tenofovir Nanoparticles: Animal Model Study

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Abstract : Introduction: Nano-drugs are novel innovations in the management of human immunodeficiency virus (HIV) pandemic, especially resistant strains of the virus in their sanctuary sites: testis and the brain. There are safety concerns to be addressed to achieve the full potential of this new drug delivery system. Aim of study: Our study was designed to investigate toxicity profile of Tenofovir Nanoparticle (TDF-N) synthesized by University of Kwazulu-Natal (UKZN) Nano-team for prevention and treatment of HIV infection. Methodology: Ten adult male Sprague-Dawley rats maintained at the Animal House of the Biomedical Resources Unit UKZN were used for the study. The animals were weighed and divided into two groups of 5 animal each. Control animals (A) were administered with normal saline. Therapeutic dose (4.3 mg/kg) of TDF-N was administered to group B. At the end of four weeks, animals were weighed and sacrificed. Liver and kidney were removed fixed in formal saline, processed and stained using H/E, PAS and MT stains for light microscopy. Serum was obtained for renal function test (RFT), liver function test (LFT) and full blood count (FBC) using appropriate analysers. Cellular measurements were done using ImageJ and Leica software 2.0. Data were analysed using graph pad 6, values < 0.05 were significant. Results: We reported no histological alterations in the liver, kidney, FBC, LFT and RFT between the TDF-N animals and saline control. There were no significant differences in weight, organo-somatic index and histological measurements in the treatment group when compared with saline control. Conclusion/recommendations: TDF-N is not toxic to the liver, kidney and blood cells in our study. More studies using human subjects is recommended.

Keywords : tenofovir nanoparticles, liver, kidney, blood cells
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