

Anti-hiv-1 drug toxicity and management strategies

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Anti-human immunodeficiency virus type1(anti-HIV-1) medications have helped millions of HIV-1-infected people lead longer and healthier lives. The goal of HIV-1 treatment is to reduce the number of virions in the body of infected individuals and to prevent rapid destruction of CD4+ T-lymphocyte cells, thus protecting the immune system. Most of the anti-HIV-1 drugs in practice are designed using viral reverse transcriptase (HIV-1RT), protease, and integrase as targets. These drugs that inhibit the activities of HIV-1RT, viral protease, and integrase are therefore known as anti-HIV-1RT, antiprotease, and anti-integrase molecules, respectively. The US Food and Drug Administration has approved 22 anti-HIV-1 drugs for clinical use. Among the drugs, most of the nucleoside analogs exhibit clinical complications that pose a threat to chemotherapy. The toxicity of these molecules arises due to their negative impact on the activities of human mitochondrial chromosomal DNA polymerases. Other anti-HIV-1 regimens are also reported to cause toxicity. The range of toxicity extends from mild to life-threatening levels. The prolonged use of zidovudine (AZT) which was first approved in 1987 as a nucleoside analogue reverse transcriptase inhibitor, has been reported to cause severe hematologic toxicity, including severe anemia, granulocytopenia, and symptomatic myopathy. Many other drugs that are often used in combination with AZT have similar toxicities. The newer antiretrovirals (ARVs), such as 22,32-dideoxycytidine, 22,32-dideoxyinosine which exhibit analogous mechanisms of action and similar toxicities to AZT. Some of these ARVs when taken during pregnancy may generate teratogenic effects. The topic of discussion includes a comprehensive analysis of the existing literature on toxicity of AIDS drugs, their mechanisms of action and possible management strategies.

Biography

T.Mounika completed Bachelor's of pharmacy from S.S.J College of Pharmacy, affiliated to J.N.T.U, Hyderabad and presently pursuing a Master's Degree (Second Semester) in the Department of Pharmacology, CMR College of Pharmacy, affiliated to Jawaharlal technological University, Hyderabad. I have participated in few national level technical symposium.

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Combination of high-fat diet-fed and low-dose Alloxan-treated rat: A model for type 2 diabetes and pharmacological screening

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The objective of the present study was to develop a rat model that replicates the natural history and metabolic characteristics of human type 2 diabetes and is also suitable for pharmacological screening. Male Sprague-Dawley rats (160-180 g) were divided into two groups and fed with commercially available normal pellet diet (NPD) (12% calories as fat) or in-house prepared high-fat diet (HFD) (58% calories as fat), respectively, for a period of 2 weeks. The HFD-fed rats exhibited significant increase in body weight, basal plasma glucose (PGL), triglycerides (PTG) and total cholesterol (PTC) levels as compared to NPD-fed control rats. Thus, these fat-fed/Alloxan-treated rats simulate natural disease progression and metabolic characteristics typical of individuals at increased risk of developing type 2 diabetes because of insulin resistance and obesity. Further, the fat-fed/Alloxan-treated rats were found to be sensitive for glucose lowering effects of insulin sensitizing as well as insulinotropic agents. Besides, the effect of antidiabetics on the plasma lipid parameters (PTG and PTC) was shown in these diabetic rats. The present study represents that the combination of HFD-fed and low-dose Alloxan-treated rat serves as an alternative animal model for type 2 diabetes simulating the human syndrome that is also suitable for testing anti-diabetic agents for the treatment of type 2 diabetes.

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