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## Investigating Toxic Effects of the HIV-RT Inhibitor 2-Phenoxymethyl-5-Chloro-Benzimidazole on Rat Liver

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**Abstract:** The aim of this study was to investigate the toxic effects of the human immunodeficiency virus- reverse transcriptase (HIV-RT) inhibitor 2-phenoxymethyl-5-chlorobenzimidazole on rat liver at the light microscopic level to gain an insight into possible effects in human subjects. To do this, an animal experimental model was constructed and rats were divided into single injected rat (SIR) and multiple injected rat (MIR) groups, as well as single and multiple solvent dimethylsulfoxide (DMSO) injected controls and an untreated control. Cellular heterogeneity was observed in a non-prominent way in the SIR group (prominent in only one area) and very prominently in the perivenous areas in the MIR group. In almost all groups, the hepatocytes were lightly to moderately stained but were moderately to darkly stained in the MIR group, in addition to a propensity to be lighter in the periportal area. In the single solvent injected and the multiple solvent injected groups hepatocyte cytoplasm displayed a granular appearance, whereas in the experimental groups (SIR and MIR) both granular and patchy appearances were seen. In the multiple injected solvent and chemical groups, some hyaline-like material was seen within hepatocyte cytoplasm. In all groups perivenous hepatocyte nuclei were both normal and large but periportal ones were larger. Especially in the MIR group more nuclei were large in both areas. In each group lipid droplet-filled (differing in size) hepatocytes were present, especially in the perivenous area, but also in the periportal area although less prominently. More periportal hepatocytes contained lipid droplets in the MIR group. In all groups sinusoids were only slightly dilated especially peripherally in both regions. Endothelial cells were normal in all groups. They were usually undetectable in the MIR and multiple solvent injected groups, especially in the perivenous area whereas they seemed bulging towards the lumen in the SIR and single solvent injected groups. Kupffer cells were usually normal in morphology and number, but in the MIR and multiple solvent injected groups they were greater in number and displayed a bulging appearance. Also in the MIR group the number of Kupffer cells was higher. The space of Disse was normal in the multiple solvent injected group but was enlarged in the other groups. In almost all groups low to moderate amounts of lipid were seen within the dilated sinusoids, especially in the peripheral periportal area. The multiple solvent injected group displayed more lipid within the sinusoids. Bile canaliculi and ducts were normal in all groups. In the SIR and multiple solvent injected groups plasma cells and lymphocytes were seen within the connective tissue of the portal area, being more numerous in the multiple solvent injected group. The cellular toxic effects of 2-phenoxymethyl-5-chlorobenzimidazole on rat liver morphology should be further investigated at the subcellular and molecular levels.

**Key Words:** AIDS, HIV-RT inhibitor, hepatic toxicity, histopathology, 2-phenoxymethyl-5-chlorobenzimidazole, dimethylsulfoxide

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