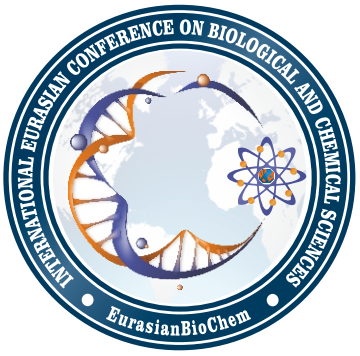


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ORAL PRESENTATION

In vitro genotoxicity assessment of gadobutrol by comet assay

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Abstract

Magnetic resonance imaging (MRI) is a high resolution imaging tool that enables the examination of anatomic, physiologic, biochemical, and molecular details of lesions in the body. In 40% of all imaging, contrast agents are administered to patients to better distinguish the tissues. Gadolinium-based contrast agents (GBCAs) have been widely used in clinical MR imaging studies for over three decades. Since gadolinium is toxic alone, it is bonded a chelating ligand to form GBCAs. Gadobutrol is one of the most commonly used GBCA during MRI, that has non-ionic and macrocyclic chemical structure. According to the recent studies, there are findings showing that GBCAs lead to gadolinium retention in the body resulting in some toxic effects. Evaluations revealed both positive and negative results in terms of genotoxicity as well. Therefore, the aim of this study was to assess the genotoxic potential of gadobutrol on human peripheral lymphocytes by comet assay. For this purpose, the isolated lymphocytes were treated with 7,000, 14,000, 28,000, 56,000, and 112,000 µg/mL concentrations of gadobutrol and incubated for 1 h at 37°C. There were also negative (distilled water) and positive (Hydrogen peroxide) controls in the experiments. It was observed that all the concentrations of gadobutrol (except 14,000 µg/mL) increased tail intensity and tail moment but only the highest concentration (112,000 µg/mL) was significant in tail intensity. Increased in tail intensity and tail moment might be occurred because of the damage like oxidation resulted from free radical formation. Thus, these results can be interpreted like gadobutrol had a weak DNA damaging effect on isolated lymphocytes. Nonetheless, further investigations should be performed for better identification of genotoxic end points of gadobutrol under other *in vitro* and *in vivo* conditions.

Keywords: Magnetic resonance imaging, Gadobutrol, Genotoxicity, Comet assay, Human lymphocytes