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Toxicity of Nanoparticle Magnetic Ferrofluid Coated with Hematoporphyrin in Rats

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Magnetic ferrofluids attract much attention in relation with their capacity as carriers to increase local concentrations of drugs in specific targeted site. Hematoporphyrin (HP) is known to have anticancer activator by producing reactive oxygen species on irradiation of light. We have succeeded in preparing novel water-based nanoparticle magne coated hematoporphyrin (HPMF), for the purpose of application of photodynamic therapy. In this study, we investigated the toxicity of HPMF administered i.v. in SD rats. HPMF was successfully distributed to the lung and liver, similar to HP, which meets the minimal requirement of the photodynamic therapy as photosensitizer. Total RBC counts were in the normal range but WBC values showed neutrophillia and monocytosis. ALT and AST, the indicators of hepatic degeneration, were statistically significantly increased in groups of HPMF. Seizure, tarchipnea and tarchicardia were appeared in the high dose group of HPMF. Iron deposition was histologically confirmed in the lung and liver at the various time points after administration of HPMF. The development of strong external magnetic fields for HPMF remains for further investigation.

Keyword : Toxicity, Magnetic ferrofluid, Hematoporphyrin