

Arsenic nanoparticles induced apoptosis more than usual in rat hepatocytes

A. Samimi^{1,*}, H. Najaf Zadeh Varzi², M. Rezaei³, A. Ashrafi⁴, Z. Mehdipour¹, G. Varnaseri⁵

¹Veterinary School, Shahid Chamran University, Ahvaz, Iran

²Pharmacology Department, Veterinary School, Shahid Chamran University, Ahvaz, Iran

³Toxicology and Pharmacology Department, Pharmacy School, Jondishapour University of Medical Sciences, Ahvaz, Iran

⁴Department of Material and Methalogy, Science School, Shahid Chamran University, Ahvaz, Iran

⁵Pharmacy School, Jondishapour University of Medical Sciences, Ahvaz, Iran

Background and Amis: Arsenic, the king of poisons, is a carcinogenic metalloid and considered as an environmental toxicant. Mitochondrial damage, reactive oxygen species elevation and eventually apoptosis induction are among the suggested mechanisms of action and also contributed to its convenient application against some proliferative states. In this study, apoptosis induction of a newly designed arsenic nanoparticle was evaluated and compared to the conventional form.

Methods: Fresh rat hepatocytes was isolated by two step collagenase perfusion method and following stabilization in rotary, exposed to 0, 10, 20, 40 and 100 microM sodium arsenite nanoparticles and also usual form for 2 hours. Viability was obtained and apoptosis determined by modified comet technic and scored accordingly.

Results: In all concentrations (0, 10, 20, 40 and 100 microM), apoptosis was demonstrated and it was clearly more prominent in hepatocytes exposed to arsenic nanoparticles. Significant differences for apoptosis scores were observed ($p < 0.05$).

Conclusions: Our results showed that arsenic nanoparticles robustly induced apoptosis that can potentially make it more toxic than usual form.

Keywords: Sodium arsenite; Nanoparticles; Rat; Hepatocytes