

RAT – AN ANIMAL'S MODEL FOR CORRECTION OF NEPHROTOXICITY USING GENTAMICIN

Judita Žymantienė¹, Rasa Želvytė¹, Vaidas Oberauskas¹, Gintaras Daunoras², Alius Počkevičius³, Juozas Jokimas², Jonas Milius⁴, Romaldas Mačiulaitis⁵

¹*Department of Anatomy and Physiology, Veterinary Academy, Lithuanian University of Health Sciences
Tilžės g. 18, LT-47181 Kaunas, Lithuania. Tel. +370 37 363204; e-mail: juditaz@lva.lt*

²*Department of Non-infectious diseases, Veterinary Academy, Lithuanian University of Health Sciences
Tilžės g. 18, Kaunas, Lithuania*

³*Department of Infectious diseases, Veterinary Academy, Lithuanian University of Health Sciences
Tilžės g. 18, Kaunas, Lithuania*

⁴*Department of Food Safety and Animal Hygiene, Veterinary Academy, Lithuanian University of Health Sciences
Tilžės g. 18, Kaunas, Lithuania*

⁵*Department of Theoretical and Clinical Pharmacology, Medical Academy
Lithuanian University of Health Sciences, A. Mickevičiaus str., 9, LT-44307, Kaunas, Lithuania*

Summary. Nowadays, gentamicin (GM) is using widely for treatment of various diseases in medicine and veterinary medicine. However, GM have a side effect. Aim of study was to determine effect of therapeutic and maximal toxic doses of GM on the Wistar rat's male weight, behavior positions, structure of kidney, sodium, potassium and phosphorus value in urine and sera for correction of an animal model for investigation nephrotoxicity. Twelve adult Wistar rats weighing 300–400 g were housed in individual metabolic “Techniplast” cages (Italy) under controlled environmental conditions. Group 1 (control) was injected intraperitoneally (i.p.) with saline (0.5 ml of 0.9 % sodium chloride per day for 14 days). Group 2 and 3 were injected with gentamicin (respectively 5 and 80 mg/kg per day, i.p. for 14 and 7 days. GM injected at a dose (5mg/kg day intraperitoneally for 14 days decreased 8.00 % rats body weight. Rats receiving GM at a dose (80 mg/kg intraperitoneally for 7 days) lost about 15.11 % body weight. According to one-way analysis of variance between GM influence on behaviour positions and rear was 99.50 % (P<0.001), head raise 96.50% (P<0.001), sit 98.90% P<0.001), hunch 88.90% (P<0.05), head dip 100.0 % (P<0.001), groom 98.60 % (P<0.001), other behaviour structure 55.10 % (P<0.05). Moreover, GM (80 mg/kg i.p. decreased concentration of Na, changed value of K and increased concentration of P in serum of Wistar rats. Influence of GM changed homeostasis of Na, K and metabolism of P in the organism of rats. There was tubular necrosis in kidneys from rats in the GM 80 mg/kg weight for 7 days treated group. There were an increased number of mesangial cells, massive tubular necrosis; the lumen of the tubules was filled with degenerate and desquamated epithelial cells. In the distal and proximal tubules was total necrosis. After treatment with GM were found inflammatory reaction in kidneys of rats. We conclude that rat treated with gentamicin 80 mg/kg body weight 7 days can be used as animal's model for investigation of nephrotoxicity.

Keywords: rat, GM, behaviour, sera, urine, kidney, histological investigation.