THE ANTINOCICEPTIVE ROLE OF MAGNESIUM AFTER INTRACEREBROVENTRICULAR ADMINISTRATION

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Aim of the study: The present study is trying to identify experimental arguments for a magnesium role in central pain modulation following an intracerebroventricular (icv) administration.

Materials and methods: Healthy adult male Wistar rats, initially weighing 350– 450 g, were used.The rats were maintained in polyethylene cages with food and water **ad libitum**, in a laboratory with controlled ambient temperature (21 ± 2°C) and under a 12h light–dark cycle. Groups of 7 rats were treated with magnesium (Mg) chloride,600 nmol Mg/ rat in 10 µL of saline. Stoelting stereotaxic equipment was used for icv administration, in previously ether-anesthetized animals. The controled group received an equal volume of saline. Hot plate and tail clip test was performed before 15, 30, 45, 60, 75 and 90 minutes after the administration of substances.

Results: Our results show that intracerebroventricular administration of magnesium chloride has an analgesic effect for the hot plate and tail clip test. The maximum effect was observed after 75 minutes in tail clip and 90 minutes in hot plate.

Discussions: While the implication of Mg as a divalent cation has been studied before in relation to pain modulation, this is the first study to look at its effects on nociception after icv administration. As magnesium blocks the N-methyl-D-aspartate (NMDA) receptor and its associated ion channels, it can prevent central sensitization caused by peripheral nociceptive stimulation. However magnesium ion can block Ca influx and at the same time can noncompetitively antagonize NMDA receptor channels

Conclusions: Magnesium has an antinociceptive effect following icv administration. However, the slow onset of the analgesic effect observed in our experiments may involve a different mechanism or site of action than cited in the literature.

Keywords: Magnesium, intracerebroventricular, nociception.

NEW 99mTC – SILICA NANOPARTICLES RADIOTRACER BIODISTRIBUTION STUDIED THROUGH SCINTIGRAPHY

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Aim of the study: Silica nanoparticles (SNP) are a new and versatile tool for targeting drug delivery. Our aim was to investigate biodistribution of a new SNP derivate in guinea pigs, in order to identify the possible uses as a drug carrier.

Materials: SNP were prepared at the *Institute of Chemistry and Bioanalytics, University of Applied Sciences Northwestern Switzerland, Muttenz, Switzerland.* One 124 nm size SNP derivate was used: AA124 - SNP carrying OH groups on the surface.

Methods: The procedure of 99mTc - SNP coupling was an in-house preparation performed as follows: 1- first of all, SNP were suspended in EtOH (5mg/ml) and sonicated for 15 or 20 min for better disper-

sion. 2- to this suspension, 200MBq/1ml of Na99mTcO4 solution was added and the suspension was stirred gently. 3- an excess of NaBH4 reducing agent was added quickly to the suspension and stirred for minimum 1 hour.

Scintigraphic study design: Groups of 4 animals were intravenously administered with 37MBq/kg/animal 99mTc-coupled AA124 SNP. Control groups received 37MBq/kg animal 99mTc. A dual head Siemens gamma camera with high resolution parallel collimators was used. The image acquisitions protocol started with a dynamic image acquisition for 60 seconds (1 image/sec), followed by a dynamic image acquisition for 4 minutes (1 image/min) and static planar images (256x256 Matrix, Zoom 2) every 15 minutes for a duration of 2h. The animals were sacrificed after 120 min and different organs were extracted entirely and submited to gamma camera.

Results: Following the i.v. administration, AA124 SNP did not penetrate the blood brain barrier. SNP were present in all the organs investigated except the brain, with different target/non target indexes, that were graphically represented for each of them.

Conclusion: These step results represent a promising support for the idea of using the AA124 as container for modular drug delivery system with promising future in therapeutics.

Key words: nanoparticles, radiotracer, biodistribution, scintigraphy.

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STUDIES REGARDING THE IN VITRO RELEASE MECHANISM AND RHEOLOGICAL PROPERTIES OF PIROXICAM FROM HYDROPHILIC GEL FORMULATIONS

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Introduction: Piroxicam is one of the most used and prescribed drug for the treatment of inflammatory diseases. When administered topically, piroxicam is a better therapeutic alternative to the systemic way because of its local effects and an improved release on affected tissues, with a low incidence of systemic side effects. As a hydrogel, piroxicam ensures a good compliance of the patient and a very good therapeutic effect at the same time.

This paper evaluates the topical release systems of piroxicam from hydrogels formulated with sodium carboxymethylcellulose, following its kinetic and rheological properties.

Methods: In vitro release studies of piroxicam from hydrogels were carried out using a modified Franz diffusion cell fitted with a synthetic membrane (in this case, cellophane). Rheological measurements were performed at two different temperatures, using a rotational viscometer Multi-Visc Fungilab, equipped with standard spindles by recording the shear stress at different speeds in ascending and then descending order

Results: The release data analyzed by the Higuchi equation provided the highest correlation coefficients. The flow curves which followed the Herschel-Bulkley model revealed a non-newtonian shear thinning behaviour.

Conclusion: The effectiveness of piroxicam released from hydrogels and the rheological characteristics are strongly influenced by the formulation properties as viscosity agents and the concentration of its