MODIFICATION OF GLOMERULAR ALBUMIN PERMEABILITY IN RAT ISOLATED GLOMERULUS BY RENIN-ANGIOTENSIN-ALDOSTERON BLOCKADE

Maciej Jankowski[1,2], Małgorzata Kasztan[2], Robert Kowalski[2], Agnieszka Piwkowska[1], Dorota Rogacka[1], Mirosława Szczepańska-Konkel[2], Stefan Angielski[1]

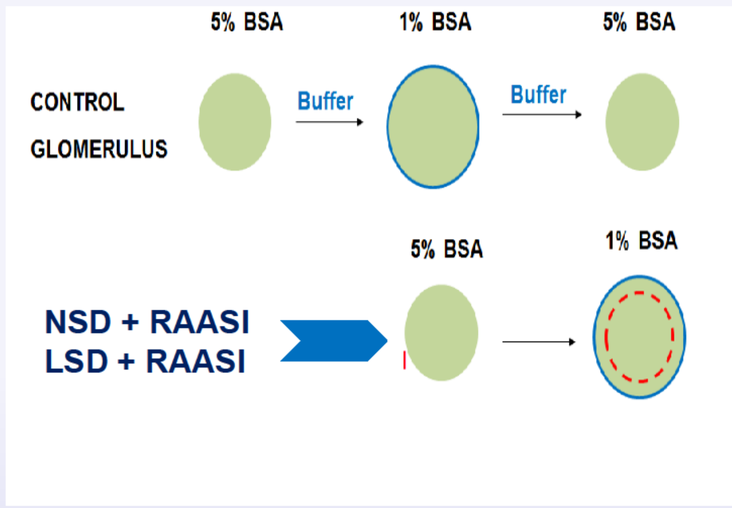
[1]-Laboratory of Molecular and Cellular Nephrology, Mossakowski Medical Research Center Polish, Gdansk, Poland; [2] -Department of Therapy Monitoring and Pharmacogenetics, Medical University of Gdansk, Poland; majank@gumed.edu.pl

Introduction and objectives

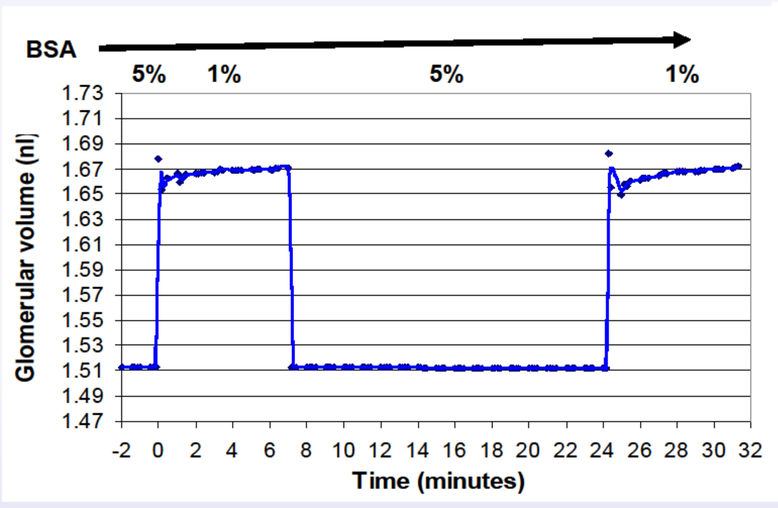
Glomerular filter consisting of endothelial cells, basement membrane and podocytes prevents plasma proteins e.g. albumin from entering the urinary space, an independent risk factor for the progression of renal failure. Activity of these cells is under control of renin-angiotensin-aldosteron system (RAAS), thus pharmacological inhibition of RAAS may affect the properties of glomerular filter.

Methods

Experiments were performed on Wistar rats maintained on normal/low sodium diet (NSD, LSD, 5 days) and RAAS inhibitors (RAASI, 7 days, p.o): aliskiren (4.3 mg/kg/24h), enalapril (0.14 mg/kg/24h), telmisartan (0.6 mg/kg/24 h) or eplerenone (0.36 mg/kg/24 h). Glomeruli were isolated and single affixed glomerulus was continuously observed with use of video-microscopy (Olympus, IX 51). Changes in the glomerular volume due to oncopressive gradient eliciting transglomerular fluid flux were used to calculate convectional albumin permeability (Palb). Nephrin and albumin in urine were measured by ELISA.



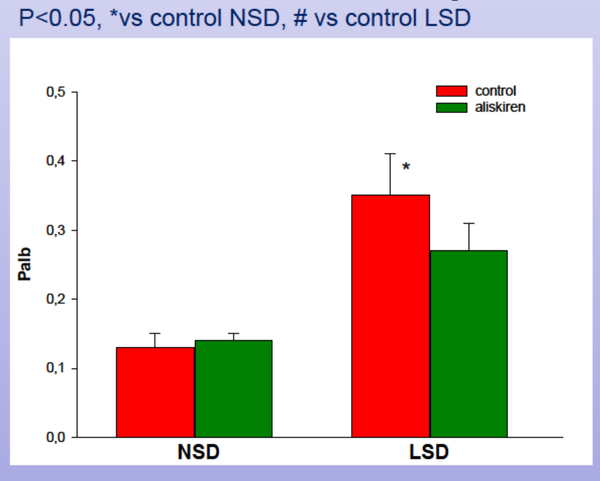
Measurement of changes of glomerular volume

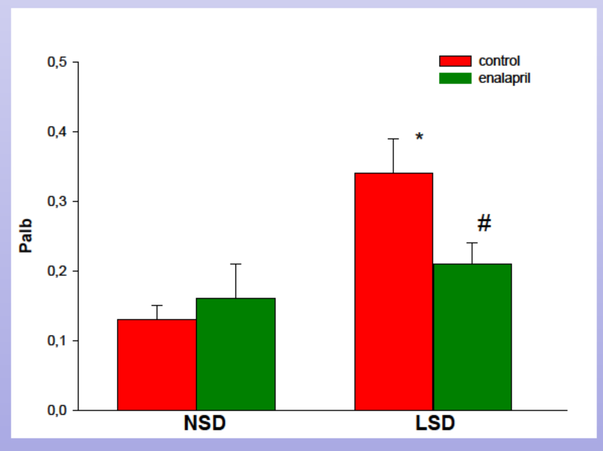


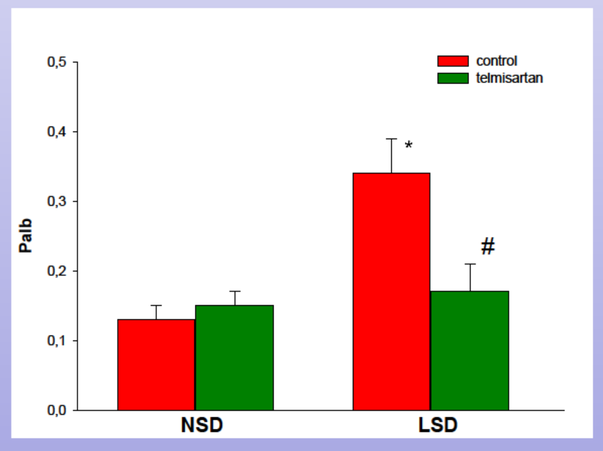
Representative recording of single glomerular volume changes in response to oncopressive medium

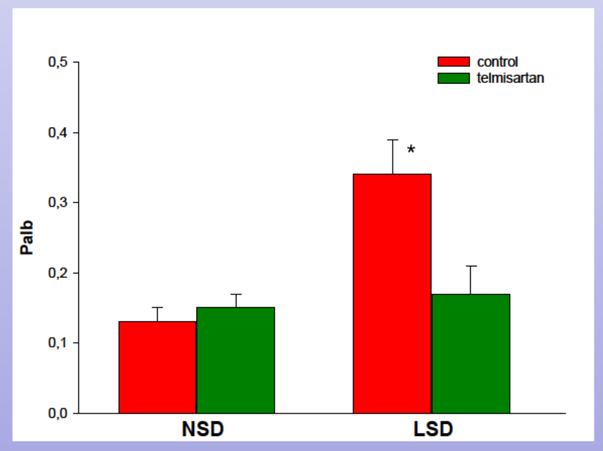
Convectional albumin permeablity

P<0.05, *vs control NSD, # vs control LSD

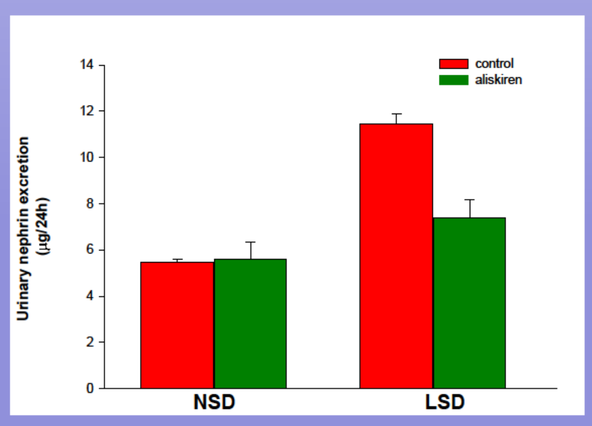


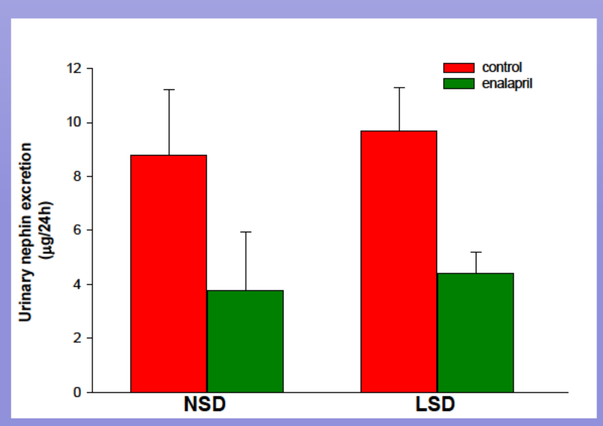


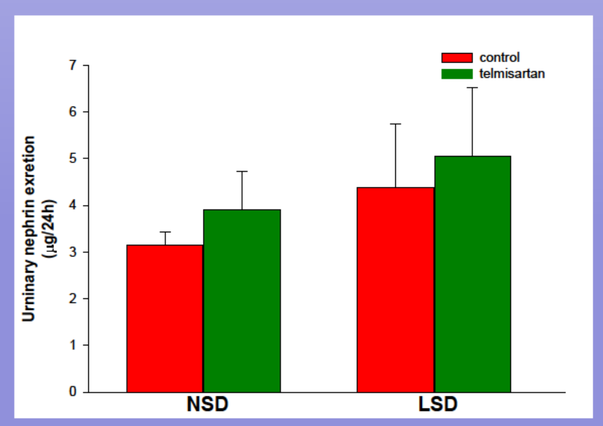


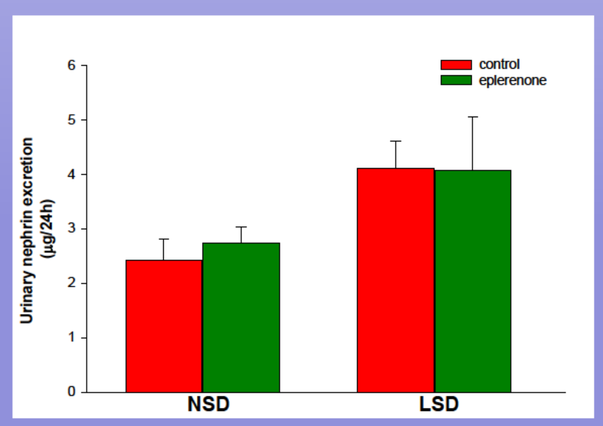


Nephrin excretion with urine

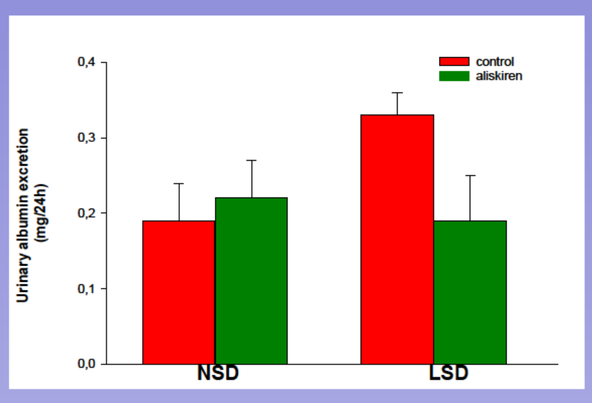


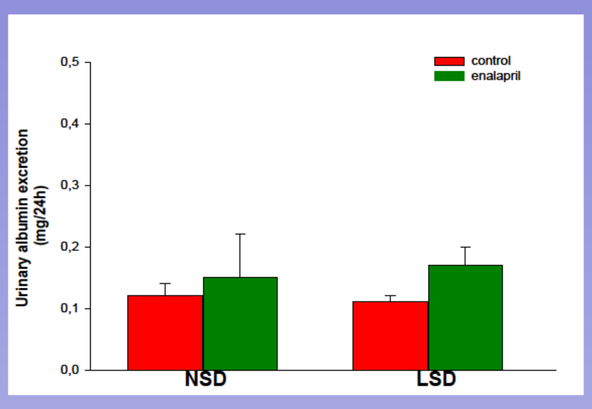


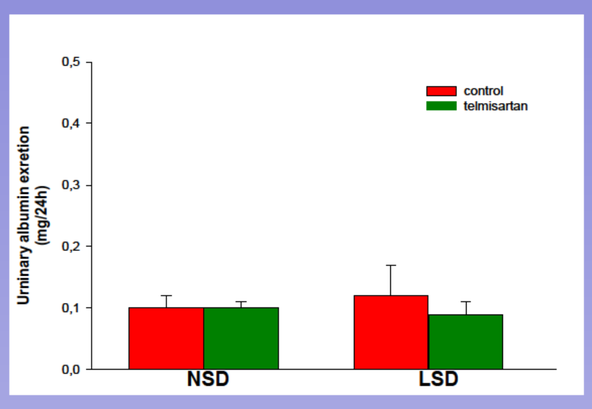


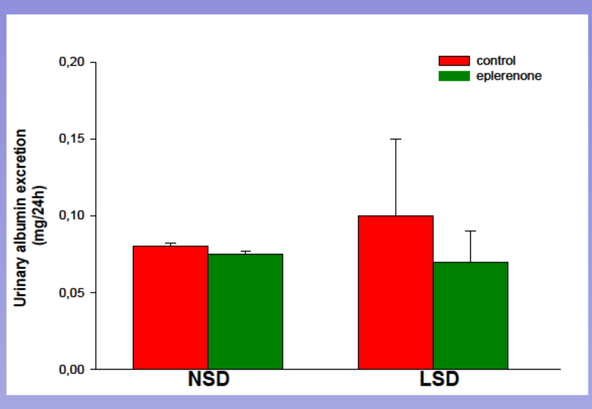


Albumin excretion with urine









RAAS blockade affects glomerular permeability for protein but its final urinary excretion may be modulated by postglomerular processes

DOI: 10.3252/pso.eu.51era.2014
Poster presented at: 51 ERA-EDTA CONGRESS AMSTERDAM 2014