Short communication

Marsanidine and 7-Me-marsanidine, the new hypotensive imidazolines augment sodium and urine excretion in rats

Magdalena Wróblewska¹, Joanna Kasprzyk¹, Franciszek Sączewski², Anita Kornicka², Konrad Boblewski¹, Artur Lehmann¹, Apolonia Rybczyńska¹

¹ Department of Pathophysiology and ² Department of Chemical Technology of Drugs, Faculty of Pharmacy, Medical University of Gdańsk, Dęblińska 17, PL 80-211 Gdańsk, Poland

Correspondence: Apolonia Rybczyńska, e-mail: anyb@gumed.edu.pl

Abstract:

Background: We have recently described the synthesis and circulatory properties of two novel centrally acting imidazoline agents: marsanidine (1-[(imidazolidin-2-yl)imino]indazole) and 7-Me-marsanidine (1-[(imidazolidin-2-yl)imino]-7-methylindazole). Marsanidine has proven to be a highly selective α₂-adrenoceptor ligand with the α₂/I₁ selectivity ratio of 3879, while 7-Me-marsanidine has been shown to be a mixed α₂-adrenoceptor/imidazoline I₁ receptor agonist with the α₂/I₁ selectivity ratio of 7.2. In the same paper, we indicated that iv administration of both compounds to Wistar rats induced a decrease in blood pressure and heart rate. The hypotensive effect of the iv administered imidazolines might be mediated not only through activation of the central α₂ and/or I₁ receptors but also through subsequent decrease of the renal sympathetic nerve activity and a direct effect on peripheral receptors. The present studies were performed to determine whether the newly synthesized compounds might influence the diuresis and sodium excretion in rats.

Methods: Both compounds were infused iv to anesthetized rats in the dose of 100 µg/kg b.w. The diuresis and sodium concentration in urine and blood samples were determined. The mean arterial blood pressure and heart rate were monitored directly throughout the experiment.

Results: A significant increase of diuresis and natriuresis was observed within 40 min after the administration of both marsanidine and 7-Me-marsanidine, in comparison to both the control period and the control group. However, between the 20 and 40 min of the experiment the natriuretic and diuretic effect of 7-Me-marsanidine was markedly higher than that of marsanidine.

Conclusion: Our study indicates that the new hypotensive imidazoline compounds of marsanidine and 7-Me-marsanidine increase diuresis and natriuresis in rats. However, the effect of 7-Me-marsanidine is markedly more potent, probably due to its moderate affinity to the I₁-imidazoline receptor.

Key words:
imidazole compounds, α₂-adrenoceptors, I₁-receptors, hypotensive, renal effects