Blood pressure, magnesium and other mineral balance in two rat models of salt-sensitive induced hypertension: Effects of a non-peptide angiotensin II receptor type-1 antagonist

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The renin-angiotensin system is critically involved in regulating arterial blood pressure (BP). Inappropriate angiotensin type-1 receptor activation by angiotensin-II (Ang-II) is related to increase arterial BP. Mg has a role in BP; it can affect cardiac electrical activity, myocardial contractility and vascular tone. To evaluate the relationship between high BP induced by a high sodium(Na) diet and Mg and other mineral balances, two experimental rat models of salt-sensitive, induced-hypertension were used: Ang-II infusion and Dahl salt-sensitive (SS) rats. We found that: 1) Ang-II infusion progressively increased BP, which was accompanied by hypomagnesuria and signs of secondary hyperaldosteronism; 2) an additive effect between Ang-II and a high Na load may have an effect on strontium (Sr), zinc (Zn) and copper (Cu) balances; 3) Dahl SS rats fed a high Na diet had a slow pressor response, accompanied by altered Mg, Na, potassium (K), and phosphate (P) balances; and 4) losartan prevented BP increases induced by Ang II-NaCl, but did not modify mineral balances. In Dahl SS rats, losartan attenuated high BP and ameliorated magnesemia, Na and K balances. Mg metabolism may be considered a possible defect in this strain, which may contribute to hypertension.

Lipocalin-2 mediates hypertension associated with obesity

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Obesity-associated hypertension is more difficult to control, due to the involvement of diversified mechanisms and multi-organ dysfunctions. Lipocalin-2 is an adipokine causatively contributes to obesity-induced endothelial dysfunction and hypertension. The present study investigated and compared lipocalin-2-mediated hypertension under both high fat diet and renin-angiotensin-aldosterone system activation. The contribution of various sources of lipocalin-2 to the development of hypertension as well as the underlying mechanisms will be discussed here.