Introduction

We are pleased to present to the readership of the American Journal of Nephrology the proceedings of an International Symposium on Calcium and Hypertension. This symposium is the first of the ‘Siena Seminars on Mineral Metabolism’ which will be held biannually in Siena, Italy.

The organizers of these seminars felt that the topic of calcium and hypertension is most appropriate to inaugurate the series of these international meetings. Indeed, several observations suggest an interaction between calcium metabolism and blood pressure. First, it has long been recognized that acute [1,2] or chronic [2-4] hypercalcemia may be associated with hypertension and acute hypocalcemia with hypotension [2,5]. This phenomenon has been attributed to an effect of calcium ions on the contractility of peripheral vessels [2-7]. Indeed, calcium channel blockers, which hinder calcium influx into the vascular wall, are potent hypotensive agents [8,9].

Second, parathyroid hormone, an agonist which plays a major role in the regulation of serum calcium concentration [10] and increases the calcium content of many cells in the body [11], affects vascular tone. Several observations indicate that this hormone is a vasodilator [12-14] and may interact with serum calcium in the process of blood pressure regulation [15].

Third, the synthesis, secretion and action of many of the hormones involved in blood pressure regulation (catecholamines, renin, aldosterone, prostaglandins) may be modulated by calcium metabolism and/or cytosolic calcium [16-24].

Finally, a large body of evidence from epidemiological studies in man [25-27] and from animal investigations in spontaneously hypertensive rats [28-30] suggest that blood pressure is significantly influenced by dietary calcium. A high intake of calcium lowers blood pressure and a low intake exerts a reverse effect.

We, therefore, felt that it is very timely to assemble physician-scientists who are involved in the research of this intriguing and complex field dealing with the interaction between calcium and blood pressure to present their data and discuss their views. The proceedings of this gathering are presented in this supplement of the American Journal of Nephrology. We sincerely hope that the readers will benefit from the data contained in this supplement and we anticipate that this information will stimulate further research to clarify these intriguing issues.

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References


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