

II. CLINICAL STUDIES

RED BLOOD CELL IONIC CONCENTRATION AND PLATELET CYTOSOLIC FREE CALCIUM AND PH IN ESSENTIAL HYPERTENSION AND CHRONIC RENAL FAILURE

We have measured the ionic concentrations (Na, K, Ca, Mg) in red blood cells (RBC) and the Ca and pH in platelets (PtCa and pH by fura-2 and BCECF methods) in 13 essential hypertensive patients (HT₁), 20 uremic hypertensive patients (HT₂), all free of antihypertensive drugs and in 20 normotensive controls (NC).

For RBC, the HT₁ and HT₂ presented significantly higher I_{Ca} , Ca and Mg than NC, the highest values have been noted in HT₂. In platelet, the PtCa are also significantly higher in HT₁ and HT₂ than in NC, with no difference between HT₁ and HT₂. PtpH were significantly more decreased in HT₁ and in HT₂ than in NC, the lowest values have been noted in HT₁.

Hemodialysis with significant weight loss can at least partially reverse the intracellular ionic abnormalities in HT₂. Antihypertensive drugs (calcium antagonists and/or angiotensin converting enzyme inhibitors) can only normalize the intracellular calcium in RBC and platelet but without any effect on RBC Na, Mg and PtpH.

Thus, in hypertension, especially with plasma volume expansion, the RBC Na, Ca, Mg and the PtCa

are increased with a decrease in PtpH. Some of these abnormalities are reversible.

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ALTERED INSULIN SENSITIVITY, HYPERINSULINEMIA AND DYSLIPIDEMIA IN HYPERTENSION-PRONE HUMANS

Essential hypertension is, in some patients, complicated by impairment of insulin-mediated glucose disposal and hyperinsulinemia. Whether this metabolic disturbance is merely a consequence of the hypertensive process and/or associated obesity or whether it may precede, and thus possibly promote, the development of hypertension has been unknown.

Searching for hereditary or familial defects in carbohydrate regulation, we prospectively investigated insulin sensitivity (using the Minimal Model Method of Bergman), plasma insulin and glucose, and serum lipoproteins in young, lean, normotensive offspring of essential hypertensive as compared with age- and body habitus-matched offspring of normotensive families.

Compared with 78 control subjects, 70 offspring of hypertensive parents had similar age (mean \pm SEM: