

Further studies on the relationship between potassium and sodium levels and adrenocortical activity

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Steroid production in vitro by dog adrenal cortical slices was measured in the presence of varying concentrations of sodium and potassium ions. Increasing concentrations of potassium produced a significant increase in the intracellular potassium content and in the rate of synthesis of aldosterone. However, the potassium effect on aldosterone secretion may also occur without changes in tissue potassium content. Ouabain significantly diminished intracellular potassium content, but inhibited aldosterone production only at the high dose of 2.5×10^{-3} M in the presence of an elevated external potassium level. Physiological changes in sodium concentration can modify aldosterone production. The effect was observed with changes as small as 10 mEq/liter sodium. Changes in external potassium and sodium levels modulate aldosterone as well as corticosterone, but not cortisol production. No changes in the intracellular content of potassium were detectable in angiotensin-stimulated tissue. Nevertheless