The property most commonly encountered among these inhibitory drugs is the enhancement of the response of adrenergic organs to norepinephrine administered. This occurs with cocaine[10], reserpine[11], and bretylium[12] as well as with some sympathomimetic amines[5]. Sensitization can be demonstrated with chlorpromazine[13]. Thyroxine, which has been found in a separate investigation to block the uptake of norepinephrine (Dengler, H. J., unpublished results), is also a potentiator.

The uptake mechanism may well be a means for terminating the biological response to catecholamines by removing them from the site of activity. Should this be so, sensitization by these drugs would be expected as a consequence of their inhibitory properties. Evidence for the termination of biological effect by some sort of intracellular re-distribution rather than by metabolic alteration of the catecholamines has been reviewed recently[14].

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Stimulation by Aldosterone of Sodium Transport in the Loop of Henle

Jones and de Wardener[1] have reported that normal subjects, when hydropenic, excrete a urine osmotically more concentrated than when given large quantities of vasopressin while hydrated. During dehydration, one element coming normally into play, besides antidiuretic hormone, is a hypersecretion of aldosterone by the adrenal cortex, as a response to the shrinkage of the liquid compartments of the body[2,3]. The possible influence of aldosterone on the concentrating capacities of the human kidney was therefore evaluated by comparing the urinary osmotic pressure after administration to hydrated subjects of vasopressin alone and of vasopressin associated with aldosterone.

Seven tests were performed on five normal young males. Two and a half units of 'Pitressin' tannate were injected subcutaneously at 8 a.m., first alone, then, one week later, in association with 0·5 mgm. of D-aldosterone-21-monoacetate in oil. The subjects emptied their bladders 2 hr. after the injections, and collected urine thereafter for a period of 8 hr. during which they were asked to drink about 1 litre of fluids in addition to their usual diet. The urine osmolality (m.osm./kgm. water) was determined with a Fiske osmometer.

The results are presented in Table 1. In the presence of aldosterone, there was a larger increase in urine osmotic pressure after injection of vasopressin.

The mean urine osmolality figure of 955 obtained after administration of vasopressin alone is comparable with the mean value of 972 reported by Jones and de Wardener, who indeed pointed out that the dose of 2·5 units of vasopressin sufficed to produce a maximal effect on the urinary osmotic pressure of their hydrated normal subjects.

Table 1. URINE OSMOLALITY IN NORMAL HYDRATED MALES AFTER VASOPRESSIN ASSOCIATED WITH OR WITHOUT ALDOSTERONE

Subjects	Vasopressin		Vasopressin + Aldosterone	
	Urine volume	Osmolality	Urine volume	Osmolality
J. C.	580	849	290	1,093
J. C.	460	1,098	305	1,175
J. C.	415	1,036	315	1,115
K. D.	310	933	350	907
M. V.	450	943	450	986
R. D.	430	885	160	1,024
R. B.	250	944	390	961

Mean $\Delta\pi$: 81·9. *S.E.* $\Delta\pi$: 33·4. $P < 0{\cdot}05$.

If aldosterone improves the concentrating ability of the human kidney, the conclusion may be drawn that this hormone stimulates the re-absorption of sodium (chloride) in the ascending limb of the loop of Henle. Sodium transport at that site, from the tubular lumen to the interstitium, is taken as the prime mover in the operation of the counter-current concentrating mechanism of the renal papilla[4,5]. Factors exerting an effect on the rate of sodium transport at that level would in turn influence the efficiency of the whole process of urine concentration. As suggested by the results presented here, aldosterone is one of these factors. They indicate, furthermore, that, even when stimulated by aldosterone, sodium transport in that part of the nephron is not linked to the secretion into the urine of other cations. It is pertinent to mention here that aldosterone has recently been shown to enhance active sodium transport in the isolated urinary bladder of the toad[6], a preparation in which sodium (chloride) movement is not coupled with cationic secretion[7].

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