

THIRST

Thirst is controlled by a multitude of complex biochemical and neuroendocrine mechanisms. The most immediate and potent stimulus of thirst is an increase in plasma osmolality. That increased osmolality activates central osmoreceptors to release ADH, which in turn acts on the kidneys to promote water reabsorption, and simultaneously there is a neurological trigger to the thirst reflex.

But what can increase plasma osmolality and thus increase thirst, and what can decrease plasma osmolality and decrease thirst? There are zillions of possibilities. Increased plasma osmolality can come from a state of overall body hypohydration. But, it can also come from poor water/electrolyte dynamics such that excessive fluid is lost from the plasma into the interstitium, or lost intracellularly. So, overall the body might have plenty of water, but it is in the interstitial or intracellular fluid compartments at the expense of the systemic plasma fluid compartment.

Another stimulus to thirst is hypovolemia, particularly when that hypovolemia is associated with Electrolyte Insufficiency. The renin-angiotensin-aldosterone systems should be able to maintain normal volume and normal blood pressure, but when they cannot, the body seeks a new equilibrium with proportionately low water and electrolytes.

So, for example, an older Parasympathetic patient with the typical capillary fragility and inadequate Sympathetic tone, will have fluid (and albumin) leaking from the plasma into the interstitium throughout the day. Thus, the swollen ankles by day's end that are relieved after a night's recumbence in bed. These patients may feel tremendous thirst during the day, yet the water they drink goes right through them and into the toilet, so they keep drinking and urinating all day long (and often all night long as the excess water accumulation in the legs by day is pulled back into the blood, then to the kidneys.)

There is another condition called water intoxication. It tends to occur in people who are somewhat neurotic, but also occurs in people who have habitually consumed too much water (as per the health food quacks recommendation to drink 10 glasses of water daily). We have already had a discussion on the harmful effects of excess water drinking --- and the whole chain reaction it can elicit. But beyond that, excess water consumption can lead to compulsive water drinking.

The paradoxical craving for water despite being over-hydrated relates to the connection between the posterior pituitary and the kidney. As the excess water intake over time literally flushes out sodium, creating a state of relative hyponatremia, an excess stimulation of ADH is provoked, which in turn suppresses the renin-angiotensin-aldosterone system of the kidneys. A relative state of hypovolemia exists that confuses the body into thinking it needs more water.

There are probably other aberrant neurological reflexes involved with the condition, but I have seen it many times in practice --- with patients who are hypotensive and have a urine specific gravity close to zero, a high urine and saliva pH, yet swear they

are thirsty and slurp water all day long, carrying their water bottle like a security blanket.

To summarize:

1. Yes, symptoms of thirst can occur in the absence of true systemic hypohydration if water has moved out of the plasma and into the interstitium and/or the intracellular fluid compartment as described above.
2. Yes, a low saliva pH is often correlated with thirst. Anaerobic patients with elevated lactic acid from anaerobic glycolysis tend to be thirsty even though they excrete a high quantity of urine of low specific gravity --- with that “watery” urine perhaps leading you to believe they are over-hydrated. Glucogenic patients tend to have a low saliva pH by virtue of excess carbohydrate intake and some degree of systemic Acidosis. Borderline diabetics will also be thirsty because of the relatively high sugar concentration in the blood and the subsequent loss of water in the urine. In many of these cases, the saliva pH is acid and related to thirst.