



DHEA AND DHEA-S

DHEA exists in two forms – free DHEA (DHEA) and sulphated DHEA (DHEA-S). DHEA-S is the inactive stored reservoir form of DHEA. DHEA-S levels do not reflect biologically active DHEA levels. It must be desulfated by the enzyme DHEA sulfotransferase (SULT2A1) in order to be active. Since DHEA is the biologically active form of the hormone, it is the only form which can be converted into androgens and estrogen and only DHEA (not DHEA-S) is protective for the brain. The active form of DHEA is produced in the adrenal glands and its free levels in the body can be measured accurately in the saliva. Measuring salivary levels of DHEA is a precise evaluation of the circadian secretions of this hormone by the adrenal cortex.

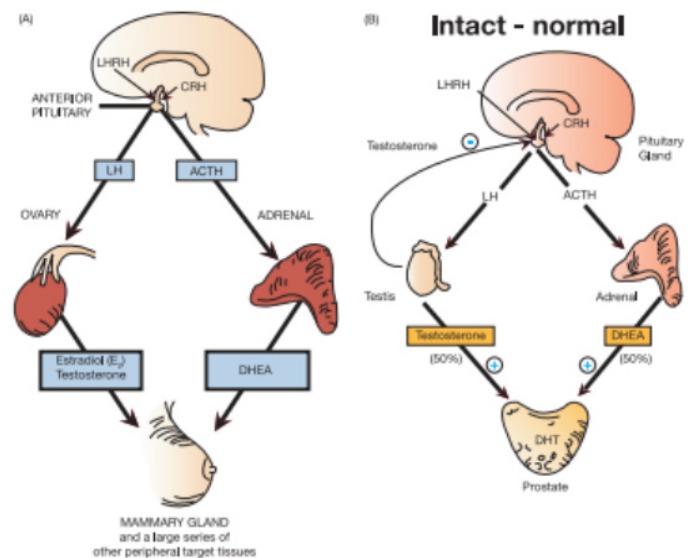
Salivary DHEA reflects the unbound, biologically active fraction of the hormone in the general circulation and shows excellent correlation with free plasma levels of DHEA. DHEA (like other steroid hormones) is a non-polar molecule. Non-polar molecules are transported very easily through the salivary gland and their concentration in saliva matches that of the free circulating levels in the body. DHEA-S on the other hand is a polar molecule. Its concentration in saliva is not a reflection of its concentration in the body.

Dehydroepiandrosterone (DHEA) is the most abundant hormone in the body. It is primarily produced in the zona reticularis of the adrenal cortex and small amounts of DHEA are produced in the brain. DHEA serves as a metabolic intermediate (prohormone) in the pathway for synthesis of testosterone, androstenedione, estrone, and estradiol. All the enzymes required to transform DHEA into androgens and/or estrogens are expressed in a cell-specific manner in a large series of peripheral target tissues (breast, prostate, skin, bone etc.), thus permitting all androgen-sensitive and estrogen-sensitive tissues to make sex steroids locally and control the intracellular levels according to their local needs.

DHEA also serves a very important role in the stress response (hence its formation is triggered by ACTH, the same chemical messenger that triggers cortisol formation). DHEA has been shown to elevate mood, calm emotions and increase alertness – all essential qualities for responding well to stress. Additionally, DHEA's effect on mood helps us cope more evenly with the stress and also helps improve memory.

DHEA and DHEA-S levels do not correlate well in pathological conditions (i.e. high DHEA levels do not necessarily lead to high DHEA-S levels). It appears that the enzyme that converts DHEA to DHEA-S (SULT2A1) is often impaired during ill health. This leads to a reduction in DHEA-S levels and a marked increase in DHEA levels.

This again underscores the necessity of testing DHEA not DHEA-S when evaluating patient and especially for those who are chronically ill.



References

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