

## CORRELATION BETWEEN LOWER URINARY TRACT SYMPTOMS AND SERUM LEVELS OF SEX HORMONES IN MEN

### Hypothesis / aims of study

Despite the fact that there is a correlation between lower urinary tract symptoms (LUTS) and male sexual function, there are few data available that describe the relationship between LUTS and sex hormones status that have an impact on male sexual function. The aim of this study was to investigate a possible correlation between the severity of LUTS and serum levels of sex hormones in men.

### Study design, materials and methods

A total of 182 randomly selected men attending our general urology clinic were recruited for the study between January and August 2004. We excluded men with endocrine diseases, prostate diseases on anti-androgen therapy, and psychological diseases. All participants completed the International Prostate Symptom Score (IPSS) and an analysis of serum levels of total and free testosterone, dehydroepiandrosterone sulfate (DHEA-S), luteinizing hormone, follicle stimulating hormone, prolactin, and estradiol. The storage symptoms were evaluated by the sum of IPSS question 2 (frequency), 4 (urgency) and 7 (nocturia). The voiding symptoms were evaluated by the sum of IPSS question 3 (intermittency), 5 (weak stream) and 6 (straining). The Spearman's rank correlation test was used to determine the relationship between LUTS and serum hormone levels. Statistical significance was defined as a P value of less than 0.01.

### Results

The mean age was  $65.8 \pm 12.9$  (means  $\pm$  SD) years (range 21 to 82). Overall, the IPSS total score was significantly correlated to age and DHEA-S ( $r=0.385$ ;  $p<0.0001$  and  $r=-0.293$ ;  $p=0.0031$ ). The storage symptoms were significantly correlated to age, DHEA-S and free testosterone ( $r=0.535$ ;  $p<0.0001$ ,  $r=-0.423$ ;  $p<0.0001$  and  $r=-0.353$ ;  $p=0.0005$ , respectively). The voiding symptoms were significantly correlated to age ( $r=0.263$ ;  $p=0.0065$ ). On the other hand, in the 65-82 years old subgroup ( $n=75$ ), there was significant correlation between the storage symptoms and DHEA-S ( $r=-0.391$ ;  $p=0.0087$ ), but no correlation was seen between the symptoms and age, as well as, between the symptoms and free testosterone.

### Interpretation of results

Overall, it appears that the dominant predictor of LUTS is the patient's age. However, in old men, the correlation between the storage symptoms and DHEA-S was only significant. DHEA-S is the primary precursors of sex steroids, and shows weak androgenic action. Recent research has demonstrated beneficial effects of DHEA-S on obesity, diabetes, cancer, atherosclerosis, enhancement of memory and viral infection. However, there is no data available that describe the effects on LUTS. DHEA-S also modulates the activity of several neurotransmitter receptors as the neurosteroids, synthesized steroids in brain. Neurosteroids appear to act through both nuclear and nonnuclear receptor mechanisms. With respect to nonnuclear receptor actions, DHEA-S has been reported to act at  $\gamma$ -aminobutyric acid A (GABA<sub>A</sub>), *N*-methyl-D-aspartate (NMDA) and/or sigma receptor. DHEA-S may modulate the activity of several neurotransmitter receptors on the micturition center in the brain as the neurosteroids.

### Concluding message

These results show that the severity of LUTS is correlated to age, serum levels of DHEA-S, and free testosterone in men. Especially in old men, the storage symptoms could be affected by serum DHEA-S level. DHEA and DHEA-S may modulate the activity of several neurotransmitter receptors on the micturition center in the brain as the neurosteroids.

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