**The Effect of Testosterone Replacement Therapy in Men with Testosterone Deficiency Syndrome on Cognitive Function and Depression**

**Introduction and Objective:** Testosterone levels decline as men age, as does cognitive function. Testosterone may play a role in regulating moods. Symptoms of testosterone deficiency syndrome (TDS) include diminished muscle mass and strength, decreased bone mineral density, anorexia, decreased libido, fatigue, dysphoria, and irritability. Some of these symptoms overlap with those of depressive illness. The aim of the present study was to evaluate the effect of testosterone replacement therapy (TRT) on cognitive function and depression in men with TDS.
**Materials and Methods:** A prospective, placebo-controlled, single-blind trial involving 68 men with TDS (calculated total testosterone <3.3ng/ml with symptoms of hypogonadism) was carried out. The patients were divided into group A (TRT, n=44) and group B (control, n=24). The patients of group A were injected with 1000mg of testosterone undecanoate. We compared the data at baseline and 6 months using the serum levels of total testosterone and prostate specific antigen (PSA), the Aging Males' Symptoms (AMS) scale, the 5-item International Index of Erectile Function (IIEF-5), the Korean Mini-Mental State Examination (K-MMSE), the Beck Depression Inventory (BDI).
**Results:** The mean ages of group A and B were 55.7±11.6 and 54.1±12.7 years old, respectively ($p>0.05$). There were no statistically significant differences in serum testosterone, PSA level, AMS, IIEF-5, K-MMSE and BDI scores between the two groups at baseline. Serum testosterone, IIEF-5, K-MMSE and BDI scores were significantly increased in group A ($p<0.05$). AMS scores were significantly decreased in the group A ($p<0.05$). A total of 2 patients with serum PSA level greater than 4ng/ml after TRT underwent a prostate biopsy but no patients were found to have prostate carcinoma. No significantly difference was observed in the group B ($p>0.05$).
**Conclusion:** TRT effectively improved serum testosterone, AMS, IIEF-5, K-MMSE and BDI scores in men with TDS. TRT may improve some aspects of cognitive ability and depression in men with TDS. For men with both cognitive impairment or depressed men and low testosterone, TRT may be considered. Large long-term studies are required to evaluate the effects of TRT on cognitive function and depression in TDS.