A randomized, double-blind, placebo-controlled trial of testosterone for treatment of postmenopausal women with aromatase inhibitor-induced arthralgias

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Abstract

Purpose

To evaluate the efficacy of testosterone supplementation for improving aromatase inhibitor musculoskeletal symptoms (AIMSS).

Methods

Postmenopausal women experiencing moderate-to-severe arthralgias while taking adjuvant aromatase inhibitors for breast cancer were enrolled in this trial. Initially, patients were randomly allocated to receive either a subcutaneous testosterone pellet versus a placebo pellet. Due to slow accrual, the protocol was modified such that additional participants were randomized to receive either a topical testosterone gel or a placebo gel. Changes in patient-reported joint pain were compared between patients receiving testosterone and those receiving placebo using a two-sample *t* test. Changes in hot flashes and other vasomotor symptoms were also analyzed. Further analyses were conducted to evaluate whether 27 single nucleotide polymorphisms (SNPs) in 14 genes previously associated with AIMSS were associated with testosterone supplementation benefit.

Results

While 64% of patients reported an improvement in joint pain at 3 months, there were no significant differences in average pain or joint stiffness at 3 or 6 months between testosterone and placebo arms. Patients receiving testosterone did report improvements in strength, lack of energy, urinary frequency, and stress incontinence ($p < 0.05$). The subset of patients receiving subcutaneous testosterone also experienced improvements in hot flashes and mood swings. An inherited variant (rs7984870 CC genotype) in *TNFSF11* was more likely to be associated with improvements in hot flashes in patients receiving testosterone.

Conclusion

The doses of testosterone supplementation used in this study did not significantly improve AIMSS.