

# **Novedex XT® Clinical Trial**

## **OHIO RESEARCH GROUP**

Ziegenfuss T.N., Mendel R.W., and Hofheins J.E. **Safety and Efficacy of a Naturally-Occurring, Orally Administered, Aromatase Inhibitor in Healthy Men.** Ohio Research Group of Exercise Science and Sports Nutrition. Wadsworth, Ohio 44281, USA. [tim@ohioresearchgroup.com](mailto:tim@ohioresearchgroup.com)

**Rationale:** In healthy men, it is known that blocking estrogen formation stimulates the HPT axis to increase *in vivo* testosterone production. Recently, a new class of dietary supplements has appeared that claim to inhibit the aromatase enzyme (i.e., decrease the transformation of aromatizable androgens [androstenedione, DHEA, testosterone] into estrogens [estriol, estrone, estradiol]), thus stimulating an increase in testosterone formation.

**Purpose:** The purpose of this pilot study was to examine the effects of a popular aromatase inhibitor, Novedex XT<sup>®</sup> (NOV-XT), on selected hormonal responses (total testosterone [TT], bioavailable testosterone [BT] and estradiol [E2]), as well as serum and plasma markers of renal, hepatic, and hematological function.

**Methods:** Using an open-label, proof-of-concept design, five eugonadal men (mean  $\pm$  SD age, height, weight, body fat: 31.6  $\pm$  2.8 yr, 174.3  $\pm$  1.8 cm, 84.3  $\pm$  3.8 kg, 11.2  $\pm$  3.3 %) ingested 4 capsules of NOV-XT prior to bed for 28 consecutive days. According to the manufacturer, each capsule of NOV-XT contains 60 mg of a proprietary blend of three naturally-occurring aromatase inhibitors: 6, 17-keto-etiiocholeve-3-ol tetrahydropyranol, 3, 17-keto-etiiochol-triene, and 3',5,7-trihydroxy-4'-methoxyflavone (supplements were provided by an FDA-registered, pharmaceutically licensed manufacturer; confirmation by an external laboratory is pending). Blood samples obtained at baseline (prior to supplementation), and at weekly intervals thereafter for 28 days, were analyzed for TT, BT, and E2 by radioimmunometric and chemiluminetic assays. Subjects were required to maintain their normal dietary and training patterns during the study. All blood samples were obtained at the same time of day (0700-0900) to minimize diurnal variation. Hormone concentrations were statistically analyzed by ANOVA and Tukey's HSD post-hoc test. Dependent t-tests were used to compare changes in blood chemistries. Statistical significance was accepted at  $p < 0.05$ .

**Results:** Compared to baseline, NOV-XT administration rapidly and significantly increased TT and BT. Mean changes from baseline for TT after one, two, three, and four weeks of NOV-XT administration were: +145% ( $p < 0.006$ ), +183% ( $p < 0.0005$ ), +232% ( $p < 0.0002$ ), and +240% ( $p < 0.0002$ ), respectively. Mean changes from baseline for BT after one, two, three, and four weeks of NOV-XT administration were: +300% ( $p < 0.01$ ), +402% ( $p < 0.0009$ ), +511% ( $p < 0.0002$ ), and +528% ( $p < 0.0002$ ), respectively. Despite these large increases in TT and BT, no significant aromatization to estradiol occurred (i.e., E2 concentrations remained unchanged). No significant changes in clinical blood chemistries (fasting glucose, BUN, creatinine, bilirubin, alkaline phosphatase, aspartate aminotransferase, alanine aminotransferase, sodium, potassium, chloride, calcium, albumin, globulin, CO<sub>2</sub>, total protein, total cholesterol, triglycerides, HDL-cholesterol, LDL-cholesterol, VLDL-cholesterol) or systemic hemodynamics (heart rate, systolic blood pressure, diastolic blood pressure) were observed, nor were any adverse events noted during the study.

Variable	Baseline	Day 7	Day 14	Day 21	Day 28
Testosterone (ng/dL)	517 (162)	1265 (252) *	1515 (212) *	1714 (322) *	1758 (435) *
Bio T (ng/dL)	159 (57)	636 (265) *	798 (94) *	971 (226) *	998 (210) *
Estradiol (pg/mL)	22 (3)	19 (9)	16 (9)	19 (11)	19 (9)
Glucose (mg/dL)	90 (4)				87 (10)
BUN:Cr	17 (5)				17 (4)
Bilirubin (mg/dL)	0.8 (0.5)				0.9 (0.5)
ALP (IU/L)	84 (32)				67 (43)
AST (IU/L)	27 (7)				27 (8)
ALT (IU/L)	29 (11)				31 (15)
Chol (mg/dL)	156 (19)				163 (27)
TAG (mg/dL)	74 (22)				72 (19)
HDL (mg/dL)	54 (3)				51 (9)
LDL (mg/dL)	87 (18)				97 (20)
SBP (mm Hg)	124 (5)				124 (11)
DBP (mm Hg)	75 (6)				74 (14)

Data are reported as mean ( $\pm$  SD). \* indicates significantly different from corresponding baseline value. Bio T = bioavailable (free+weekly bound) testosterone, BUN:Cr = blood urea nitrogen:creatinine ratio, ALP = alkaline phosphatase, AST = aspartate aminotransferase, ALT = alanine aminotransferase, Chol = total cholesterol, TAG = triglycerides, HDL = high density lipoprotein, LDL = low density lipoprotein, SBP = systolic blood pressure, DBP = diastolic blood pressure.

**Conclusions:** Within the framework of the current experimental design, these preliminary data indicate that four weeks of NOV-XT supplementation significantly elevates serum TT and BT, likely via the inhibition of estradiol formation. Further, NOV-XT does not appear to result in any deleterious effects on blood chemistry or systemic hemodynamics in healthy, eugonadal men. Future research is necessary to confirm and refine these results in a larger sample size, as well as examine the impact of NOV-XT on androgenic and estrogenic metabolites, body composition, and muscular performance. Supported in part by a research grant from Gaspari Nutrition (Neptune, NJ).

