

# Efficacy and short-term safety of testosterone treatment in adolescents with gender dysphoria

## Introduction

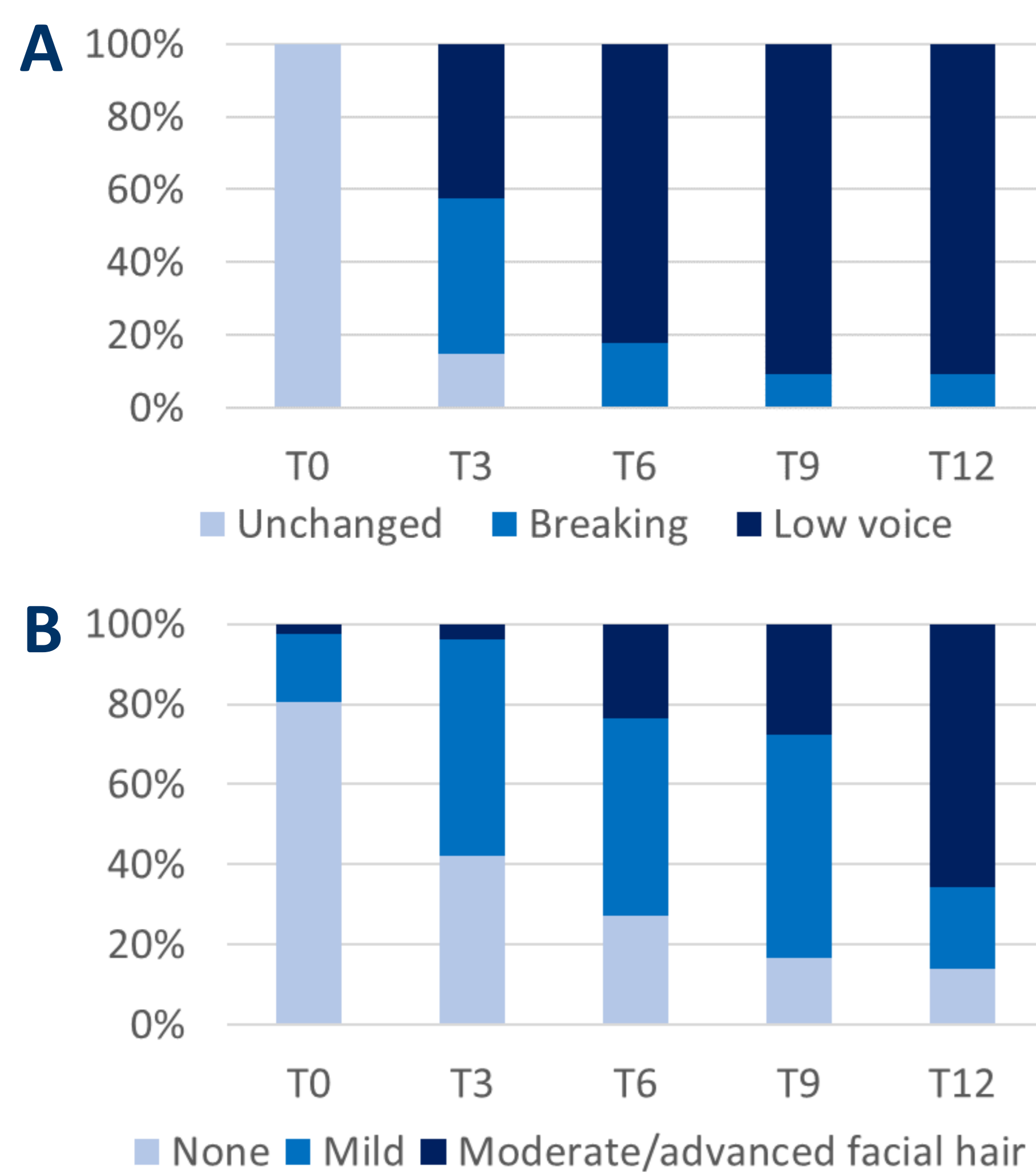
Although many adolescents with gender dysphoria (GD) are being treated with GnRH analogues (GnRHa) and gender affirming hormones there is a paucity of data on the effects and side effects of this treatment in this population. We aimed to study virilisation, laboratory safety parameters and bone mineral density during testosterone treatment in transboys.

## Methods

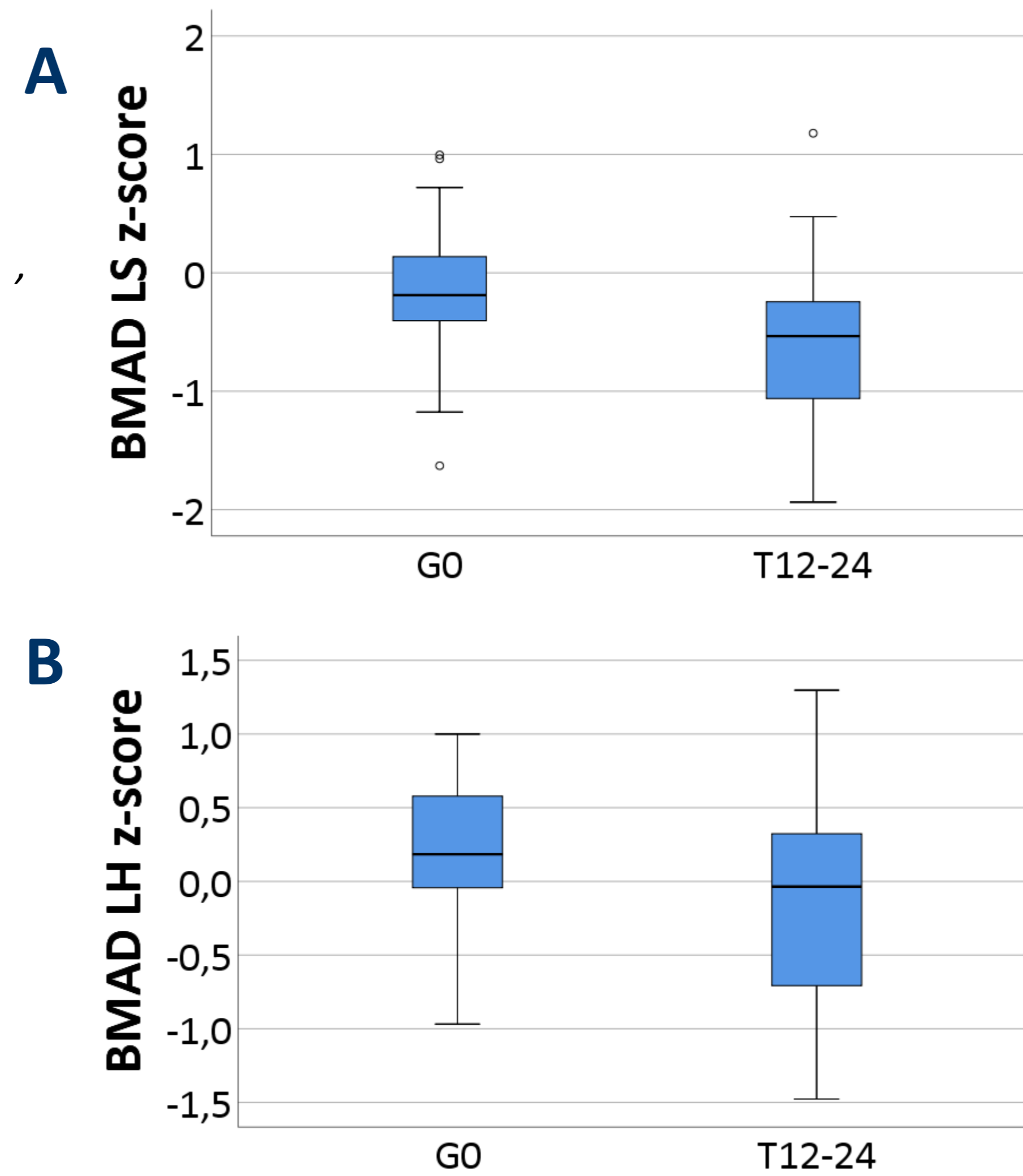
After mental health assessment adolescents were treated with triptorelin 3.75 mg s.c. every 4 weeks to which increasing doses of testosterone esters i.m. every 2 weeks were added from age 15-16 years. Laboratory evaluation was performed every 6 months and dual X-ray absorptiometry at the start of treatment and then every 1-2 years. Bone mineral apparent density (BMAD) and BMAD z-scores were calculated according to Ward et al. (Arch Dis Child, 2007).

## Results

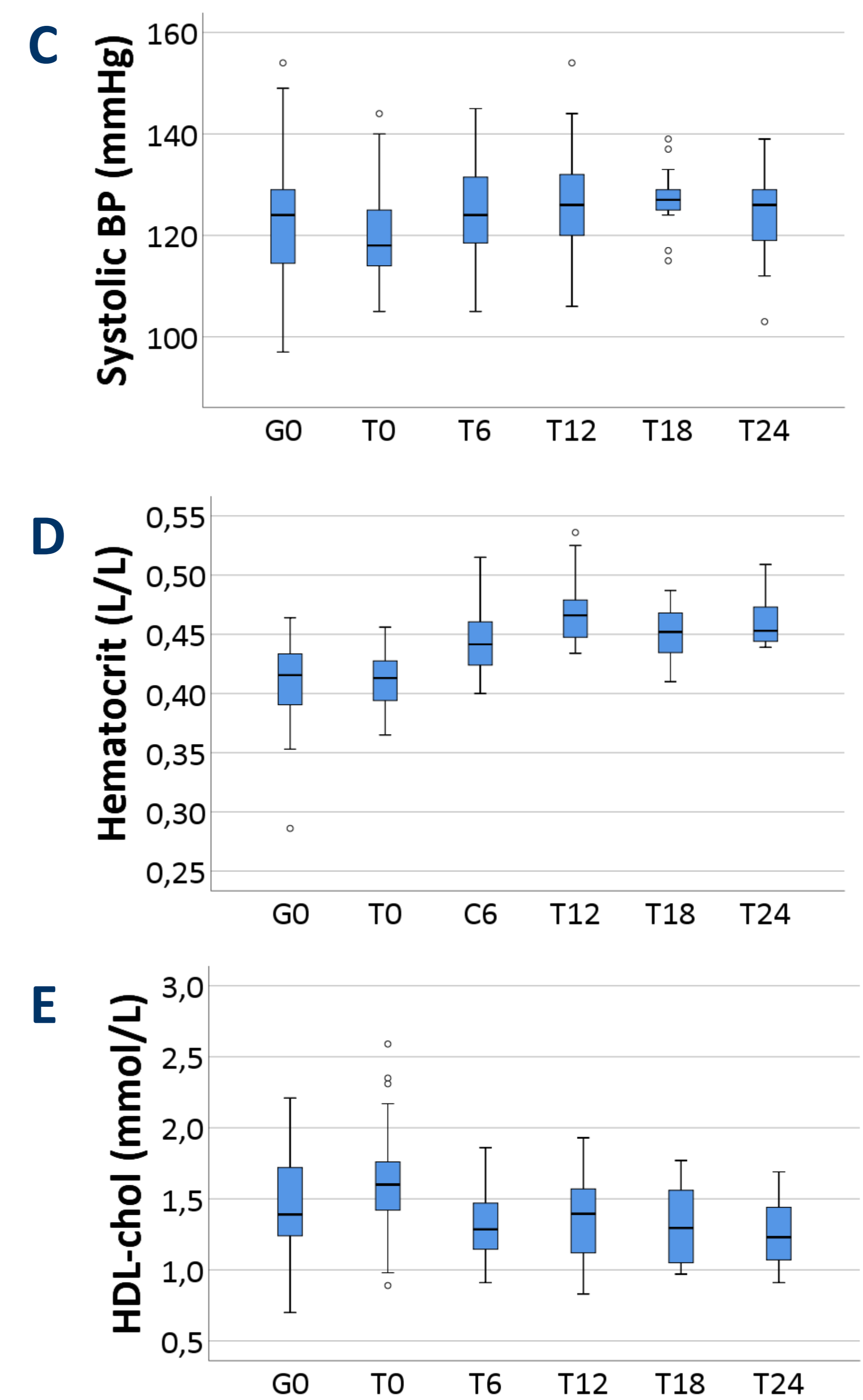
Sixty-two adolescents had been treated with GnRHa, and subsequently with testosterone from a median age of 17.2 years (range 14.9-18.4) for a median duration of 12 months (range 5-33). In 85% testosterone treatment led to a drop of voice within three months (fig 1A) whereas facial hair gradually increased in the first year (fig 1B). Acne was common and most prevalent at 6-12 months. BMAD z-scores after 12-24 months of testosterone were lower than z-scores before the start of GnRHa although the difference was only significant at the lumbar spine (fig 2A and B). Systolic blood pressure significantly increased (fig 2C). The haematocrit also increased (fig 2D) whereas HDL-cholesterol decreased (fig 2E). Vitamin D deficiency was common (32-54%).



**Figure 1.** Changes in voice (A) and facial hair (B) after 0-12 months of testosterone (T0-T12).



**Figure 2.** Bone mineral apparent density (BMAD) z-score at the lumbar spine (A) and the left hip (B), systolic blood pressure (C), haematocrit (D) and HDL-cholesterol (E) at the start of GnRHa (G0) and after 0-24 months of testosterone (T0-T24).



## Discussion and conclusions

Testosterone leads to change of voice and increased facial hair starting within three months. Acne is common. Although the treatment seems safe in the short term, the increased haematocrit and decreased HDL-cholesterol which have also been observed in previous studies, might have implications for future cardiovascular health. The reduced BMAD z-scores after GnRHa and subsequent testosterone treatment are another concern and the long-term consequences of this treatment for bone health warrant further study. Counselling of adolescents about these findings is essential as well as providing advice on how to avoid further risk factors for cardiovascular events and osteoporosis through for example diet, vitamin D supplements, exercise and refraining from smoking.

