

POSTER PRESENTATION

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# Low free testosterone is associated with hypogonadal signs and symptoms in men with normal total testosterone levels: results from the European Male Ageing Study

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## Background

During ageing, total testosterone (TT) declines and SHBG increases, resulting in a greater decline of free testosterone (FT) compared to TT. However, guidelines suggest using TT to diagnose androgen deficiency and to reserve FT only for men with borderline TT. We investigated if isolated low FT or isolated low TT was associated with androgen-related endpoints in healthy men.

## Methods

3369 community-dwelling men, aged 40-79, were included. We assessed differences between men with both normal TT (=10.5 nmol/L) and calculated FT (=220 pmol/L) (referent), men with normal TT/low FT (group 1) and men with low TT/normal FT (group 2) by descriptive statistics and ordinal logistic regression adjusted for age, centre, BMI and comorbidities.

## Results

2540 men had normal TT (18.4-5.5 [mean-SD] nmol/L) and FT (326-75 pmol/L). There were 261 men in group 1 (normal TT (14.2-3.7 nmol/L), low FT (195-22 pmol/L)) and 92 men in group 2 (low TT (9.6-0.7 nmol/L), normal FT (247-20 pmol/L)).

Compared to referent, men in group 1 were older and had higher SHBG, whereas group 2 was younger and had lower SHBG. Men in group 1, but not group 2,

were in poorer health, had lower haemoglobin and a decrease in bone ultrasound measurements. Regression analysis showed that men in group 1 had less frequent morning erections, more erectile dysfunction, fewer sexual thoughts and more physical symptoms (limitations in doing vigorous activity, walking 1 km and bending). Compared to referent, sexual and physical symptoms did not differ in group 2.

## Conclusions

Independent of age, BMI and comorbidities, men with isolated low FT, but normal TT, have more androgen deficiency-related symptoms than men with normal TT and FT levels; whereas symptoms do not differ in men with isolated low TT. Not only total, but also FT levels should therefore be assessed in men with hypogonadal symptoms.

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