

Press release - Abstract 481: Effects of testosterone therapy on morphology and grade of NAFLD in obese men with functional hypogonadism and type 2 diabetes

EMBARGOED UNTIL MONDAY 25 MAY 2021 AT 14:00 CET

According to a new study, testosterone therapy may reduce non-alcoholic fatty liver disease in obese men with functional hypogonadism and type-2 diabetes.

Testosterone therapy may help obese men with functional hypogonadism and type-2 diabetes reduce the prevalence of non-alcoholic fatty liver disease (NAFLD), according to a study being presented at the 23rd European Congress of Endocrinology (e-ECE 2021), on Tuesday 25 May 2021 at 14:00 CET (www.ece2021.org). The two-year study found that therapy with testosterone undecanoate normalised testosterone levels, reduced NAFLD, and suppressed the symptoms of hypogonadism in men living with these conditions.

NAFLD is emerging as a public health issue worldwide. It is estimated that prevalent cases will increase 21% by 2030, from 83.1 million to 100.9 million.¹ NAFLD is more commonly found in people with type-2 diabetes, and is linked to obesity, insulin resistance and atherogenic dyslipidemia. NAFLD refers to excess fat accumulation in the liver, in the absence of excessive alcohol consumption. Alcohol consumption of less than 30 g (3.75 units) per day for men is used as the cut-off to diagnose NAFLD.² As an increasing global health issue, this study and its findings may be a promising area for further research.

Dr Kristina Groti Antonic and her team from the University of Ljubljana, Slovenia, carried out a large study on the effects of testosterone therapy on glycemic control, metabolic parameters, vascular function and morphology in obese men with hypogonadism and type-2 diabetes mellitus. They presented a part of this study at e-ECE 2021 in which they evaluated the effects of testosterone therapy on morphology and grade of NAFLD in this population. The two-year clinical trial saw 55 males with functional hypogonadism and type-2 diabetes participate. The first year focused on a double blind, placebo-controlled study and the following year was used for follow-up.

During the study, the participants were randomised into two groups. The first group received testosterone undecanoate during both years of the study, while the second group received a placebo in the first year and testosterone therapy in the second year. A range of tests including testosterone levels, prostate specific antigen and routine blood tests were assessed at the beginning of the trial, 12 and 24 months. Liver ultrasounds for NAFLD grade assessments were performed at the beginning and after two years, which showed an improvement in NAFLD grades after two years of the trial.

Dr Kristina Groti Antonic shared that, “improvement of NAFLD grade was a result of improved insulin resistance, reduction in body mass index and body weight, along with changes in body composition.

¹ Chris Estes and others, “Modelling the epidemic of non-alcoholic fatty liver disease demonstrates an exponential increase in burden of disease,” *Hepatology*, 2018 Jan; 67(1): 1. Accessed here: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5767767/pdf/HEP-67-123.pdf>

² NICE, Non-alcoholic fatty liver disease (NAFLD). Accessed here: <https://cks.nice.org.uk/topics/non-alcoholic-fatty-liver-disease-naflD/>

As we know, testosterone increases lean body mass at the expense of fat mass, either alone or in combination with behavioral and lifestyle modifications. Testosterone with its anti-inflammatory effects also reduced chronic inflammatory state in the liver. Our study shows that testosterone therapy could be used as a suitable therapy for obese men living with non-alcoholic fatty liver disease, and therefore the findings can be used to tackle this growing pandemic.”

This knowledge could help obese men living with functional hypogonadism and type-2 diabetes experience normalised testosterone levels and reduced prevalence of non-alcoholic fatty liver disease.

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Notes for Editors

1. The presentation “Effects of testosterone therapy on morphology and grade of NAFLD in obese men with functional hypogonadism and type 2 diabetes” will take place on Tuesday 25 May at 14:00 CET, online during e-ECE 2021.
2. e-ECE 2021 is held online on the 22-26 May 2021. You can access [here](#).
3. The [European Society of Endocrinology](#) was created to promote research, education and clinical practice in endocrinology by the organisation of conferences, training courses and publications, by raising public awareness, liaison with national and international legislators and by any other appropriate means.

CONTACT INFORMATION

ESE media office
María Maseda
European Society of Endocrinology Media Office
ese-media@hkstrategies.com
T: +32 (0) 2 73 79 545
M : +32 (0) 492 51 71 87

Abstract

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Effects of testosterone therapy on morphology and grade of NAFLD in obese men with functional hypogonadism and type 2 diabetes

Category: Diabetes

AIMS: Non-alcoholic fatty liver disease (NAFLD) is emerging as a public health issue worldwide, is highly prevalent in patients with type 2 diabetes (T2D), and is linked to obesity, insulin resistance and atherogenic dyslipidemia. We aimed to evaluate effects of testosterone therapy (TTh) on morphology and grade of NAFLD in obese men with functional hypogonadism (FH) and T2D.

RESEARCH DESIGN AND METHODS: 55 obese males with FH and T2D participated in a two-year (first year double-blind, placebo-controlled study, second year follow-up) clinical trial. Total, calculated free and calculated bioavailable testosterone levels, fasting plasma glucose, glycated hemoglobin A_{1c}, lipids (total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides), prostate specific antigen, routine blood tests (complete blood count, electrolytes, urea, creatinine, liver tests) were

assessed at baseline, 12 and 24 months. Liver ultrasounds for NAFLD grade assessments were performed at the beginning and after two years. T-test and Wilcoxon's signed rank were used to detect changes from baseline. Normality of distribution of data was assessed with Shapiro-Wilk test.

RESULTS: Participants were randomized into two groups. Group T (n = 28) received 1000 mg testosterone undecanoate (TU) both years of the study while group P (n = 27) received placebo first year and TU second year. Liver assessment showed improvement in NAFLD grades at statistically significant level ($P < 0.001$) after two years of TRT. TTh normalized testosterone levels in both groups within first year and stayed in normal range after the second year of the study. No adverse events (prostate carcinoma, cardiovascular events) or side effects of TRT have been observed over the two-year course of this trial.

CONCLUSIONS: Two-year therapy with testosterone undecanoate normalized serum testosterone levels, reduced NAFLD grade, and quells the symptoms of hypogonadism in obese men with functional hypogonadism and T2D.