Sex-hormone binding globulin is increased in amyotrophic lateral sclerosis: preliminary observations

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Introduction

Muscle trophism and functions strictly depends on testosterone serum levels, which are decreased in amyotrophic lateral sclerosis (ALS). Interestingly, testosterone serum levels relies on the binding to the sex hormone-binding globulin (SHBG) that regulates transport of androgen into the bloodstream and controls the bioavailability of the free hormonal fraction.

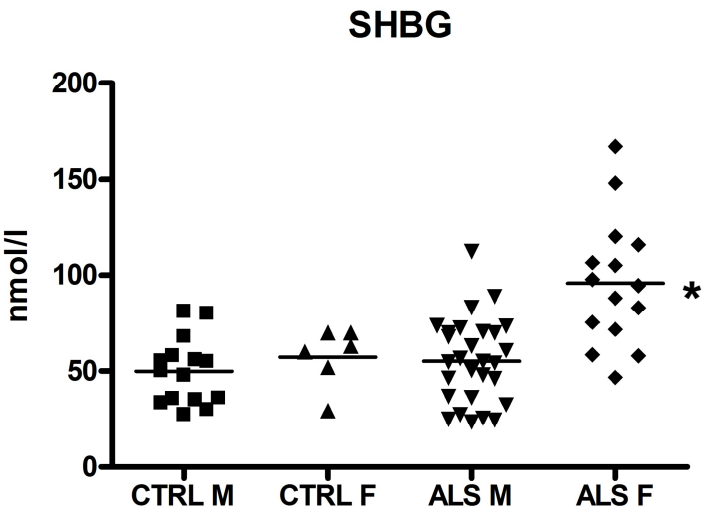
Aim of this pilot study consisted in assessing SHBG serum levels in ALS patients with respect to healthy matched controls (CTRL).

Methods

43 consecutive ALS outpatients (28M/15F; age: 63.9 ± 10.0 y.o., range 42-82; ALSFRS-R: 31.8 ± 9.3, range 17-47; disease duration: 45.9 ± 34.0 months, range 7-161) were recruited together with 21 CTRL. Serum SHBG was assessed by electrochemiluminescence immunoassays (Cobas C6000 E601, Roche Diagnostics, Mannheim, Germany).

Results

• Serum SHBG levels were +30% in ALS vs. CTRL ($p<0,05$);
• At the moment, this difference was consistent only for the female group of patients (see **Figure**);
• Clinical and demographic characteristics did not show any correlation with the obtained results.



ANOVA $p<0.0001$, followed by Newman-Keuls multiple comparison post hoc test *$p<0,01$ *vs.* all the other groups

Ongoing experiments:

- Increasing sample size (e.g., CTRL F)
- Measuring testosterone and DHEAS serum levels
- Assessing albumin serum levels
- Calculating free and bioavalable testosterone
- Caculating DHEAS to albumin molar ratio

Conclusions

Increased SHBG serum levels in ALS might result in abnormalities in testosterone availability with consequent lack of sustain for muscle trophism and functions. This is in agreement with the evidence that overexpressing transgenic SHBG in mice results in a progressive motor disorder characterized by hind limbs paralysis. **Further confirmation in a larger cohort of subjects is needed.**

References

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