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Authors have nothing to disclose

## Objectives and hypotheses

The aim of our study was to examine the effects of GH-therapy on the concentration and conformation of carotenoids and compare these data with the state of the blood-antioxidant-system in girls with Turner syndrome (TS).

## Methods

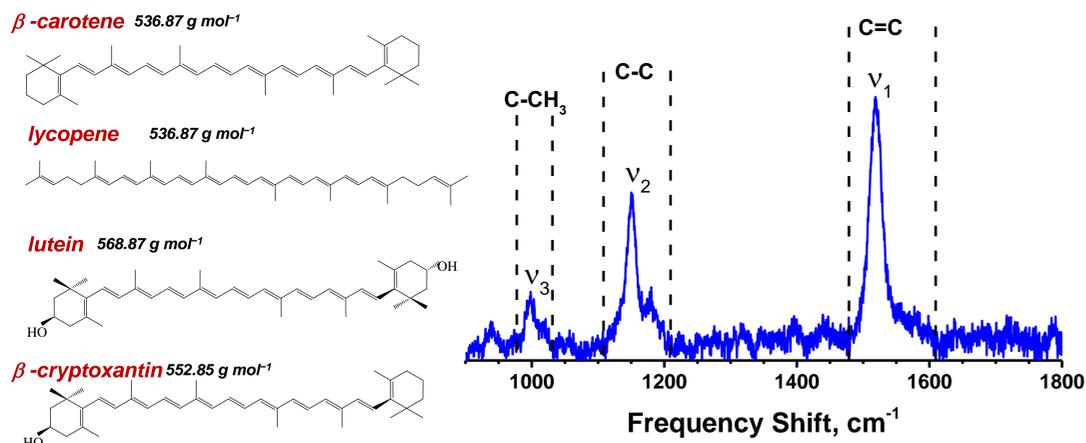
12 prepubertal girls (aged 12-14 yr; median 13.2 yr) with TS were included in the study. All of them have not been treated with GH before. The data of 11 prepubertal children (2 girls, 9 boys; aged 6-11 yr; median 9.3 yr) used as control.

The conformation of carotenoids in blood plasma were examined with the use of Raman spectroscopy.

The parameters of the blood antioxidant system, complete blood count and insulin-like growth factor 1 (IGF-1) were also measured.

All parameters were measured before and after 12 months of GH treatment (0.05 mg/kg/day).

## Predominant carotenoids in plasma have identical Raman spectra



Raman Spectral Band	Signify
$V_1$	Stretching modes of the conjugated C=C bonds
$V_2$	Mixture of C-C and of C=C bond stretching modes with C-H bending mode
$V_3$	Stretching modes of C-CH <sub>3</sub> bonds between the main-chain and the side methyl carbon. Most rigid bonds. Worst changeable.
Area of $V_1$ band	Proportional of total carotenoid s concentration

**Bands' maximums shifts in results of carotenoids conformation changing**

## Conclusions

1. The total concentration of carotenoids in girls with TS before treatment was significantly lower than in the control and increased significantly during the treatment to values comparable to the control.
2. The increasing of the total concentration of carotenoids correlated with value of TBARS (tiobarbituric acid reactive substances). This may be interpreted as a protective mechanism of reactive oxygen species.
3. The conformation of C-CH<sub>3</sub> group in carotenoid molecule group in the treatment group was significantly different from the conformation one in control group and did not change during the treatment.

## Results

### The clinical data of girls with TS

\* - significant difference between parameters before treatment and after 12 months, value was evaluated using Wilcoxon test,  $p < 0.05$

#- significant difference between control and treatment groups before treatment, value was evaluated using Mann-Whitney test,  $p < 0.05$

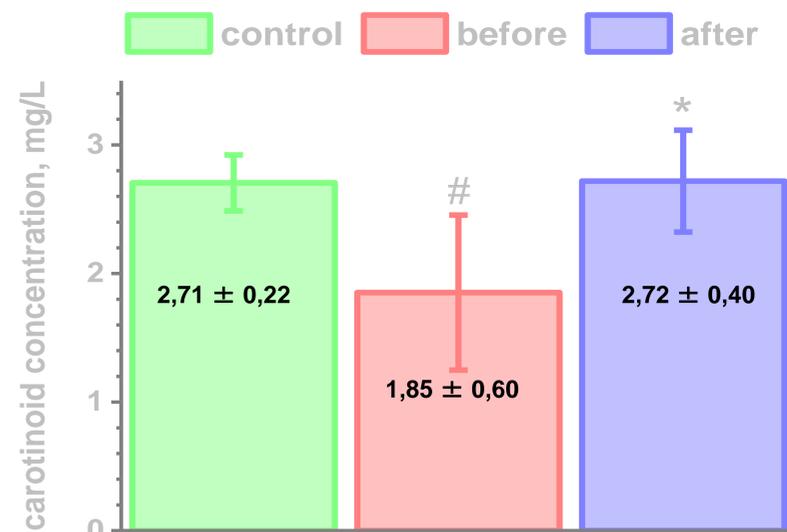
Parameters	Before treatment	After 12 months
Height, cm	130.1±6.8	139.1±4.1
Height velocity, cm/yr	3.7±0.3	9.3±1.0
Height SDS	-3.4±1.0	-2.8±1.1
IGF-1, ng/ml	275±53	756±146

### The antioxidant status parameters of girls with TS

Parameters	Control	Before treatment	After 12 months
Total antioxidant capacity of plasma, a.u.	0.26±0.07	0.29±0.02	0.33±0.06
TBARS, g/L	4.7±0.39	3.07±0.23	4.3±0.5
Superoxide Dismutase (SOD), a.u./g Hb	14.5±3.4	18.8±5.0	14.2±3.7
Catalase (Cat), a.u./g Hb	216±38	215±14	162±10
Ceruloplasmin, µg/mL	518±70	568±41	566±43
100*SOD/Cat	6.8±1.7	8.8±1.4	8.8±2.1

The changing of antioxidant status parameters may be interpreted as development of oxidative stress.

### The total concentration of carotenoids in girls with TS treated during 12 months



### The band maximum of carotenoids spectra (conformation) in girls with TS treated during 12 months

