

### INTRODUCTION

**Turner syndrome (TS)** predisposes to obesity and related metabolic disorders and presents a high risk of congenital heart defects. Growth hormone (GH) treatment used in TS girls also affects the parameters of carbohydrate-lipid metabolism. Thus, the search for new markers that could be early predictors of metabolic disorders seems to be justified.

#### AIM & METHOD

- 1. The assessment and comparison of :
- MMP-1, MMP-2, MMP-9 (matrix metalloproteinase-1, -2, -9),
- (brain-derived neurotrophic BDNF factor),
- (glial cell line derived • GDNF neurotrophic factor),
- VEGF (vascular endothelial growth factor)

concentration and basic clinical makers cholesterol, HDL cholesterol, (total triglycerides, glucose, ALT, AST, IGF1, TSH and fT4) in:

- 12 untreated (before GH therapy) TS girls (study group),
- 17 healthy short stature girls (control group).

Evaluation of shifts in markers concentrations in 9 TS girls after at least **3-month GH treatment period.** 

# **Brain-derived Neurotrophic Factor and Matrix Metalloproteinases** as markers of metabolic status in girls with Turner Syndrome

- o ALT,
- o BDNF,
- MMP-2;

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#### RESULTS

• no differences in mean age, weight, BMI Z-Score and hSDS between study and control group;

groups differed in mean baseline values of:

• a positive correlation between:

• MMP-2 and HDL concentration ( $\beta = 0.502$ , t(17) = 2.393, p=0.029),

• BDNF and BMI Z-score ( $\beta = 0.582$ , t(17) = 2.948, p=0.009);

• a significantly higher concentration of MMP-2 in patients undergoing GH treatment than before the onset of therapy (132.1 ±42.3 vs. 105.0±45.5, p=0.045).

## CONCLUSIONS

• The higher concentrations of BDNF and lower of MMP-2 in TS girls without metabolic syndrome may reflect the formation of metabolic status.

• Shifts in MMP-2 concentration during GH therapy may be considered as connected with metabolic alterations.

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|                   | Study group (n=12)             | Control group (n=17)           | P value |
|-------------------|--------------------------------|--------------------------------|---------|
| Tch [mg/dl]       | 186.9 ± 26.4                   | 177.9 ± 20.5                   | NS      |
| LDL [mg/dl]       | 118.0 ± 20.0                   | $101.2 \pm 22.0$               | NS      |
| HDL [mg/dl]       | 53.5 ± 8.5                     | 61.6 ± 10.5                    | NS      |
| TG [mg/dl]        | 76.7 ± 31.7                    | 75.8± 23.1                     | NS      |
| fT4 [ng/dl]       | $1.45 \pm 0.26$                | $1.34 \pm 0.13$                | NS      |
| TSH [IU/ml]       | 2.99 (2.71 – 3.33)             | 2.325 (1.84 – 3.00)            | NS      |
| ALT [IU/l]        | 18.2 ± 4.2                     | 14.2 ± 4.1                     | 0.02    |
| AST [IU/1]        | 29.9 ± 7.1                     | 31.8 ± 5.2                     | NS      |
| glucose`0 [mg/dl] | 88.1 ± 7.6                     | 86.1 ± 6.3                     | NS      |
| IGF1 [ng/ml]      | 178.3 ± 89.5                   | 138.3 ± 57.7                   | NS      |
| VEGF [pg/ml]      | 15.99 (6.19 – 22.72)           | 48.11 (13.93 - 92.48)          | NS      |
| MMP-9 [ng/ml]     | 165.41 (97.36 – 385.00)        | 227.96 (193.87 – 380.19)       | NS      |
| BDNF [pg/ml]      | 29951.54 (26176.87 – 41271.88) | 23131.69 (18392.37 – 28313.33) | 0.01    |
| MMP-1 [pg/ml]     | 2078.14 (1408.12 – 2539.28)    | 1489.91 (992.25 – 2495.51)     | NS      |
| MMP-2 [ng/ml]     | 91.84 (71.71 – 111.03)         | 143.63 (123.67 - 244.46)       | <0.001  |

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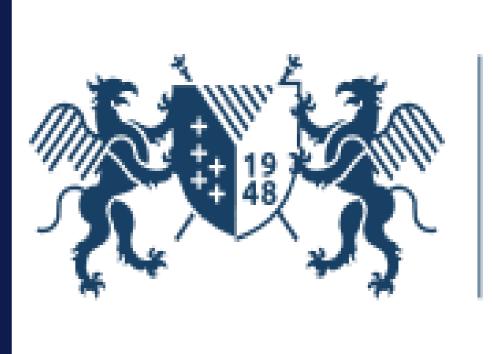
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