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Effect of growth hormone treatment in combination with estrogens on the lipid profile and systolic function of the left ventricle girls with Turner syndrome

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Objective

Turner syndrome occurs in one out of every 2,500 to 3,000 live female births. The risk of hypertension is estimated to occur in 7–17% of children and 24–40% of adults with TS. We performed this study to assess effects of growth hormone (GH) treatment combined with estrogens on lipid metabolism and systolic function of the left ventricle (LV) in girls with Turner syndrome (TS) without clinically relevant cardiac abnormalities.

Design and method

16 girls with TS $12,2 \pm 0,9$ years old, not treated before, were recruited in the study and treated with GH (0,05 mg/kg/daily) and estrogens (17 β -estradiol, applicated 0.25-0.5-1 mg/daily with a dose increase every 6 months) during 2 years. Anthropometry, systemic BP was assessed every 3 months. Total cholesterol (TH), low density lipoproteins (LDL), high density lipoproteins (HDL), triglycerides (TG) levels were measured every 6 months, LV systolic function (LVSF) was estimated by echocardiography every 12 months. The measurement parameters were: LV end diastolic (LVED), LV end systolic (LVES), LV ejection fraction (LVEF).

Results

	Baseline	1 year	2 year	P (0-1)	P (0-2)
Age (year)	12,2 \pm 0,9	-	-	-	-
Height gain (sm)	-	6,67 \pm 2,1	14,9 \pm 2,6	-	-
Total cholesterol (mmol/l)	5,1 \pm 1,1	4,5 \pm 0,8	4,6 \pm 0,7	0,338	0,2301
LDL (mmol/l)	3,3 \pm 0,9	2,6 \pm 0,7	2,7 \pm 0,7	0,276	0,00036
HDL (mmol/l)	1,3 \pm 0,3	1,4 \pm 0,3	1,5 \pm 0,3	0,815	0,116
TG (mmol/l)	1,0 \pm 0,8	1,1 \pm 0,4	1,1 \pm 0,4	0,368	0,544
LVEF (%)	61,9 \pm 4,3	62,0 \pm 3,7	62,3 \pm 3,7	0,920	0,735
LVED (ml)	45,2 \pm 10,1	50,9 \pm 12,0	57,1 \pm 10,7	0,211	0,0002
LVES (ml)	17,4 \pm 4,9	19,4 \pm 5,1	21,6 \pm 5,3	0,2981	0,00024

The height gain was 14.9 ± 2.6 cm over a period of treatment. Mean BP was within the age-related normal range and without statistically significant changes before and during 2 years of treatment.

During 2 years of GH-therapy TH was decreased from 5.1 ± 1.1 to 4.6 ± 0.7 mmol/l ($p=0,2307$) and LDL was significantly decreased from 3.3 ± 0.9 to 2.7 ± 0.7 mmol/l ($p=0,0003$). TG and HDL levels were not changed related to baseline.

At baseline the LV dimensions of all the girls were within normal range. LVED was significantly increased from $45,2 \pm 10,1$ to $57,1 \pm 10,7$ ($p=0,0002$), LVES was significantly increased from $17,4 \pm 4,9$ to $21,6 \pm 5,3$ ($p=0,00012$) during 2 years of GH-therapy. There were not significant changes in LVEF between baseline and 2-years timepoint. These data give evidence that systolic function of the left ventricle did not become lower.

Conclusion

GH-therapy combined with estrogens in girls with TS improved the lipid profile and did not impair the systolic function of the left ventricle.

Authors have nothing to disclose

