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## OBJECTIVES

Turner Syndrome (TS) is one of the most common genetic disorders associated with abnormalities of chromosome X. One of the markers of bone metabolism is osteocalcin (OC) and its elevated level indicates osteoporosis. The objective of our study was to determine the OC level in the blood in girls with TS, depending on the karyotype and age for early diagnosis of metabolic bone disorders. We investigated the OC level in 14 girls with TS (45,X (n=8), 45,X/46,XX (n=3), structural abnormalities of chromosome X (n=3)) of different age: 7 patients at 4-11 y.o. and 7 – at 12-18 y.o.

## METHODS

Was assessed the state of bone metabolism in girls with TS measuring bone mineral density (BMD) (Z-score, SD) by DXA, serum levels of OC, FSH, LH and estradiol. We conducted the study of the blood levels of osteocalcin, parathyroid hormone, LH, FSH, estradiol using the two-stage enzyme immunoassay with the automatic analyzer Access Immunoassay System (Ireland). Biochemical diagnostic methods used to study the electrolytes in serum (Ca<sup>++</sup>, P) by ionoselective method on the analyzer Easy Lyte Calcium Na/Ca/pH ANALYZER (Netherlands).

## RESULTS

### OC levels in girls with TS of different ages (Me [25; 75])

Years	Osteocalcin, ng/ml		
	TS	Control group	p
4-11 y.o.	75.63 [65.69; 145.85]	38.36 [32.15; 67.92]	0.03
12-18 y.o.	97.02 [71.39; 115.30]	48.40 [40.56; 84.24]	0.002

No significant differences were found of OC levels in TS patients with different karyotypes (p > 0.05)

No statistically significant association was found of OC level with the content of FSH, LH, estradiol and the BMD degree (Z-score).

At the same time the OC level was higher than the age normal in 60.03% of TS girls over 12 years, and was normal in all patients 4-11 y.o.

OC level was elevated in 100% patients with osteoporosis (Z-score > (-)2,5 SD) and in 75.0% - with osteopenia (Z-score of (-)1,0 - (-)2,5 SD).

We have identified a decrease of bone metabolism in 76,87% of TS girls, including:

- osteoporosis - at 30.66% patients,
- osteopenia - at 46.21% patients.

### OC levels in girls with TS different karyotypes (Me [25; 75])

Karyotype	Osteocalcin, ng/ml
45,X	97.02 [71.39; 141.20]
45,X/46,XX	84.76 [76.02; 100.40]
Structural abnormalities of chromosome X	115,30 [63.47; 174.00]

No significant differences were found of OC levels in TS patients with different karyotypes (p > 0.05)

## CONCLUSIONS

- The level of the OC in girls with TS was not dependent on its age, karyotype and level of sex hormones.
- In 71.43% of all girls with TS and in 100.0% with osteoporosis OC level was higher than the normal age reference.
- Determined of OC should be carried out to all of TS girls for early detection of osteoporosis and holding his treatment.

## References

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