

# THYROID STATUS IN YOUTH WITH METABOLIC SYNDROME

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## INTRODUCTION

The widespread prevalence of obesity in young people often leads to the formation of metabolic syndrome. At the same time, the state of thyroid function in young people with Metabolic syndrome (MS) has not yet been established.

## AIM

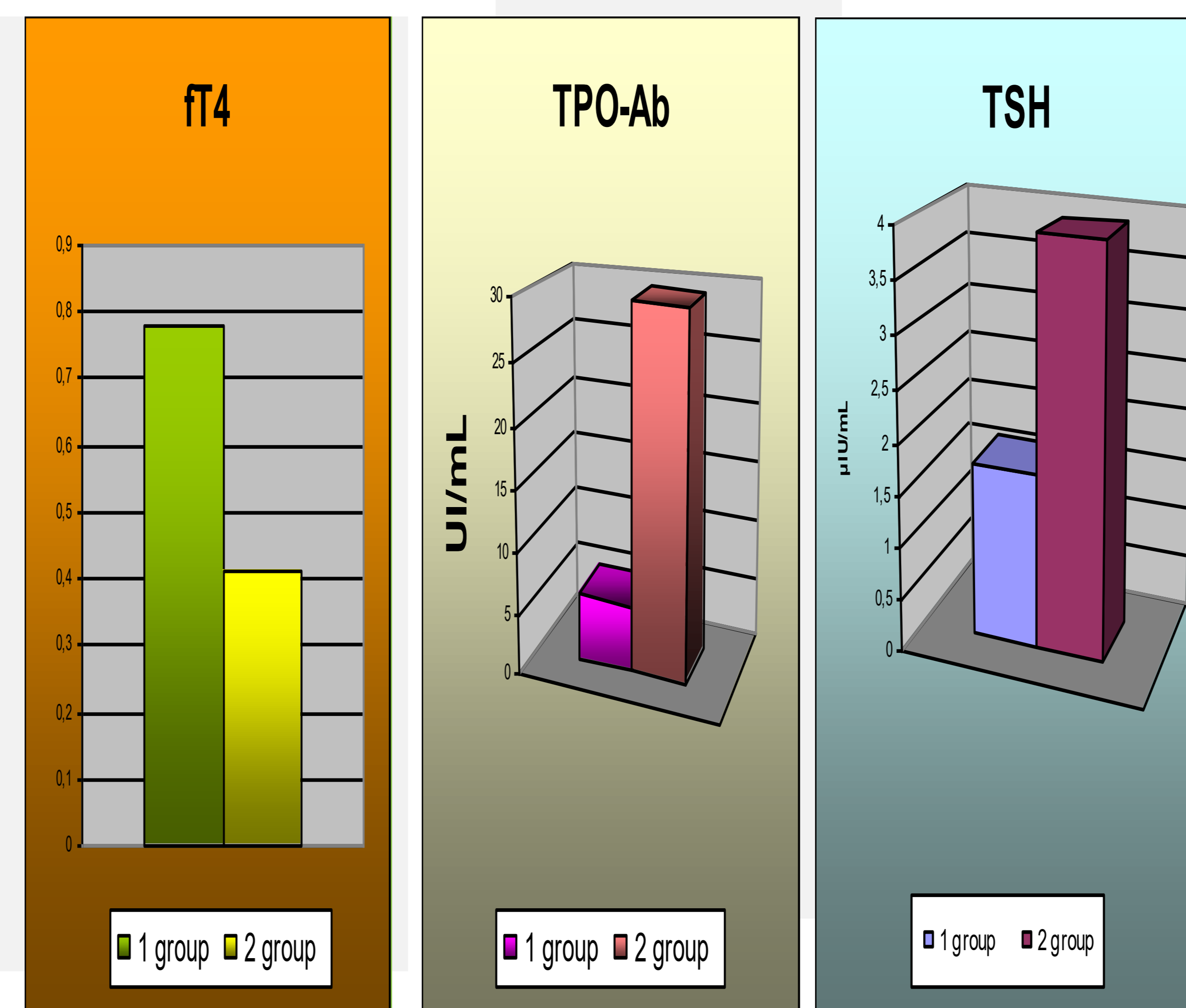
To study the thyroid status in young people with metabolic syndrome.

## METHOD

**Materials and methods.** The study involved 46 patients (25 boys and 21 girls) with MS at the age of  $18 \pm 3.1$  years. The inclusion criteria were an increase in body mass index (BMI) more than  $30.0 \text{ kg / m}^2$ , simultaneously recorded insulin resistance, dyslipidemia, arterial hypertension, and disorders of carbohydrate metabolism. In all subjects, the HOMA-IR insulin resistance index was higher than 2.77, there was an increase in triglycerides, atherogenic dyslipidemia. All patients underwent ultrasound examination of the thyroid gland, thyroid stimulating hormone (TSH), free thyroxine (fT4), free triiodothyronine (fT3), antibodies to thyroglobulin (AbTG) and antibodies to thyroperoxidase (AbTPO) were determined. The control group consisted of 22 obese patients without metabolic syndrome. Statistical significance was determined by the STATISTICS system for Windows.

## RESULTS

In 1/3 of the surveyed, a tendency to increase in size of thyroid gland was noted, and in 2/3 a significant ( $p < 0.05$ ) increase in the volume and echogenicity of the thyroid gland. A direct relationship was found between the size of the thyroid gland and BMI. 52% of patients showed a significant ( $p < 0.05$ ) increase in TSH and normal fT4, half of them had a significant increase in AbTPO and an insignificant increase in AbTG. An insignificant decrease in the concentration of fT4 and fT3 and a slightly increased concentration of TSH were recorded in 20% of the subjects. There was a significant increase in AbTPO in 30% of patients. Half of the patients had a significant increase in AbTG. A positive correlation was found between the concentration of TSH and BMI, the index of insulin resistance HOMA-IR and the index of atherogenicity.



In 12% of young people with MS, there is a significant ( $p < 0.05$ ) increase in TSH in combination with a significant decrease ( $p < 0.05$ ) of fT4 and a significant increase in AbTPO, which indicates autoimmune thyroiditis with hypothyroidism.

**Table. Thyroid parameters in patients with Metabolic Syndrome (2 group) (HOMA-IR  $\geq 2.77$ )**

	1 (control) group (obesity) (n=22)	2 group (MS) (n=46)	p
TSH ( $\mu\text{IU/mL}$ ) (median)	1.67 (0.96, 2.29)	3.99 (3.59, 4.98)	<b>0.020</b>
fT4 (ng/dL) (median)	0.81 (0.70, 0.98)	0.39 (0.30, 0.59)	<b>0.049</b>
fT3 (ng/dL) (median)	1.3 (1.12, 1.43)	1.4 (1.21, 1.44)	0.050
TPO-Ab (UI/mL) (median)	5.4 (3.5, 22.5)	39.9 (27.8, 48.8)	<b>0.025</b>
Tg-Ab (UI/mL) (median)	1.6 (0.9, 2.1)	2.4 (1.2, 3.5)	0.056
Thyroid volume (mL) (median)	14.1 (11.2, 14.8)	15.1 (11.7, 17.9)	0.712

HOMA-IR: homeostasis model assessment of insulin resistance index; TSH: thyroid-stimulating hormone; fT4: free thyroxine; fT3: free triiodothyronine (fT3); TPO-Ab: antithyroid peroxidase antibodies; Tg-Ab: antithyroglobulin antibodies

## CONCLUSIONS

A significant increase in TSH was found in 52% of patients with MS. Autoimmune thyroiditis with hypothyroidism was registered in 12% of young people with Metabolic Syndrome. Insufficiency of the thyroid gland, especially in combination with the stimulation of antibody production, may be one of the mechanisms for the development and progression of MS in young people. Further research is needed on this issue.

## REFERENCES

1. Tolstikova, O., Aharkov, S. *The Characteristic of Thyroid Status in Overweight and Obese Young People with Insulin Resistance* HORMONE RESEARCH IN PAEDIATRICS Volume: 91 Pages: 553-554. SEP 2019.

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