



Introduction

Prevalence of obesity has been rising throughout the world. Metformin is considered as an option for treatment in children with insulin resistance. During the last decade, numerous studies have been published demonstrating that metformin delays the risk of type 2 diabetes mellitus (T2DM) in obese children and adolescents through overcoming insulin resistance.

Aim

The aim of this study was to retrospectively evaluate the subjects who used metformin treatment due to insulin resistance and exogenous obesity in our clinic and assess the effects of metformin on anthropometric and metabolic variables.

Methods

- The medical records of the 36 patients, who were started metformin therapy due to obesity and insulin resistance, were retrospectively evaluated.
- Patients with T2DM and improved glucose tolerance were excluded from the study.
- The anthropometric and metabolic variables of the obese individuals at the sixth month of treatment who received metformin were compared with basal values.

Results

- The study consisted of a population of 36 patients with 72.2% (26) girls and 22.8% (10) boys.
- 14 patients (45.2%) → elevated plasma triglyceride levels
- 5 patients (16.1%) → elevated plasma total cholesterol
- 3 patients (9.7%) → elevated plasma LDL (↑ 95th percentile)
- After treatment, plasma cholesterol levels were lower than before treatment but not statistically significant.
- Statistically significant decrease was detected after six months of metformin treatment in weight SDS, BMI, and BMI SDS of individuals (Table 1).
- A mean reduction of 2.41 ± 1.93 kg/m² in BMI values of study subjects was present ($p < 0.001$).
- Statistically significant reductions in post-treatment fasting insulin, fasting glucose/insulin ratio, HOMA-IR, and Quick were index values were found (Table 1,2).

Table 1. Comparison of the characteristics of the patients before and after treatment

	Before Treatment (n=23)	After Treatment (n=23)	P*
Weight SDS	2.2 ± 0.8 (2.29)	1.9 ± 0.9 (1.8)	<0.001
Height SDS	0.4 ± 1.5 (0.7)	0.3 ± 1.5 (0.50)	0.130
BMI (kg/m ²)	32.3 ± 6.0 (31.3)	29.9 ± 6.0 (29.8)	<0.001
BMI SDS	2.1 ± 0.4 (2.2)	1.8 ± 0.6 (1.9)	<0.001
Fasting glucose (mg/dL)	84.4 ± 11.8 (87)	86.3 ± 8.6 (87)	0.465
Fasting insulin (µIU/mL)	26.3 ± 13.2 (22.8)	18.1 ± 8.0 (15.4)	0.005
Fasting glucose/ fasting insulin	3.9 ± 1.6 (3.7)	5.7 ± 2.5 (5.5)	0.004
HOMA-IR	5.6 ± 3.2 (4.7)	4.0 ± 2.0 (3.4)	0.015
Quick index	0.3 ± 0.02 (0.3)	0.3 ± 0.02 (0.3)	0.014

Table 2. Rate of insulin resistance

	Before Treatment	After Treatment	p*
Fasting glucose/ fasting insulin	91.7 %	33.3 %	0.021
HOMA-IR	69.4 %	39.1 %	0.039
Quick indeks	91.7 %	38.9 %	0.039

Conclusion

- Metformin is one of the treatment options in obese adolescents with insulin resistance.
- In our study, it was observed that improvement in anthropometric measurements and metabolic parameters was achieved without any serious side effects in who received metformin treatment.

