

LONG-TERM FOLLOW-UP OF NON-DIABETIC OBESE CHILDREN AND ADOLESCENTS TREATED WITH METFORMIN

Melikşah Keskin, Zehra Aycan, Semra Çağlar Çetinkaya

Dr. Sami Ulus Obstetrics and Gynecology and Pediatrics Training and Research Hospital, Ankara-TURKEY

BACKGROUND

Childhood obesity is an important public health problem with increasing prevalence. Type 2 diabetes (T2DM) is strongly associated with obesity and metabolic syndrome. Addressing obesity and insulin resistance by drug treatment represents a rational strategy for the prevention of T2DM.

METHOD

Patients who were diagnosed with obesity at our clinic were screened retrospectively. The diagnosis of obesity was made with a body weight over + 2 SD of the body weight for age and gender. Cases who had undergone an oral glucose tolerance test (OGTT) and found to have insulin resistance (total insulin at OGTT >300 mIU/ml and homa-IR >3.4), aged between 10 and 18 years, and treated with 425 mg metformin bd in addition to lifestyle change for a year were included in the study. The study group consisted of 12 cases without a T2DM diagnosis or additional medical problems, who had no previous history of drug use for insulin resistance or drug use that could cause obesity, and with regular follow-up for a minimum of 2 years after metformin treatment of one year.

RESULTS

A total of 12 cases including 8 girls with a mean age of 13.2 ± 2.1 years and mean follow-up duration of 3.9 ± 1 years were included in the study. While the body mass index (BMI) of the cases at presentation was 31.2 ± 5.6 kg/m² and BMI-SDS was 2.7 ± 0.7 , the BMI-SDS value after one year of metformin treatment was found to have regressed to 1.9 ± 1 ($p=0.04$), and the BMI-SDS value two years after the interruption of metformin treatment had increased to 2.1 ± 1.04 but was not as high as the period before metformin treatment ($p=0.033$). The mean homa-IR value measured at the beginning was 4.8 ± 1.66 and was found to have regressed to 2.47 ± 1.53 at the end of the 1st year ($p=0.008$). Although it increased to 3.48 ± 1.63 2 years after the interruption of metformin treatment, it was still lower than the homa-IR value before metformin treatment was started ($p=0.021$).

Table 1. Table 1. Anthropometric measurements, fasting blood sugar, insulin, homo-IR, HgAa1c, 120th minute glucose, total insulin in OGTT levels of the cases before metformin, at the first year of metformin treatment, and one and two years after the discontinuation of metformin

	Pre-metformin	Metformin treatment 1st Year	1st year after the discontinuation of metformin	2nd year after the discontinuation of metformin
	Mean \pm St. Dev.	Mean \pm St. Dev.	Mean \pm St. Dev.	Mean \pm St. Dev.
BMI	31.2 ± 5.6	28.4 ± 5.8	28.3 ± 6.1	30.4 ± 6.4
BMI-SDS	2.7 ± 0.7	1.9 ± 1	1.98 ± 1.05	2.1 ± 1.04
Fasting glucose (mg/dl)	87.5 ± 0.8	85.3 ± 8.8	85.6 ± 5.4	85.3 ± 4.3
Fasting insulin	21.9 ± 6.8	11.5 ± 6.9	14.1 ± 3.6	16.7 ± 7.7
Homa-IR	4.7 ± 1.7	2.5 ± 1.5	3 ± 0.8	3.5 ± 1.6
Hba1C	5.3 ± 0.35	5.1 ± 0.26	5 ± 0.37	5.1 ± 0.25
120th minute glucose (mg/dl)	113.1 ± 20.7	-	-	-
Total insulin in OGTT	506.5 ± 203.3	-	-	-

CONCLUSION

We determined in our study that one-year metformin treatment improved the BMI SDS and homa-IR values of the obese children and this improvement decreased but continued in the second year after the discontinuation of the treatment. A severe side effect of metformin was not observed in any case. We conclude that metformin treatment has a positive effect on BMI and insulin resistance in obese children and adolescents and its effects on metabolic syndrome needs to be evaluated with larger case studies

