



Leptin, Adiponectin and Obesity-Related Gene Polymorphisms in Childhood-Onset Type 1 Diabetic Girls

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Background/Aim

- Dysadipocytokinemia is associated with insulin resistance in adult T2DM with obesity.
- Little evidence is available regarding serum adiponectin, leptin and their relationships with glycemic control and obesity-related gene polymorphisms in childhood-onset T1DM.
- We investigated the relationships between serum adipocytokine levels, obesity-related gene polymorphisms, glycemic control (HbA1C), daily insulin dosage, BMI and blood pressure.

Patients and Methods

- Type 1 diabetic girls
 - 24 patients, 15.94 ± 4.5 years old
- Blood sampling
 - once a year for more than three years serially (sampling duration: 5.6 ± 1.6 years)
- Adipocytokines
 - Leptin
 - Adiponectin
 - Elisa kits
- Obesity-related gene polymorphisms
 - uncoupling protein-1 gene (UCP1, -A3826G)
 - 3 β-adrenergic receptor gene (3 β AR, Trp64Arg)
 - adiponectin gene (SNP45, 164, 276, 349)
 - PCR direct sequences

Fig.1

Relationship between Leptin, Adiponectin, L/A ratio and age

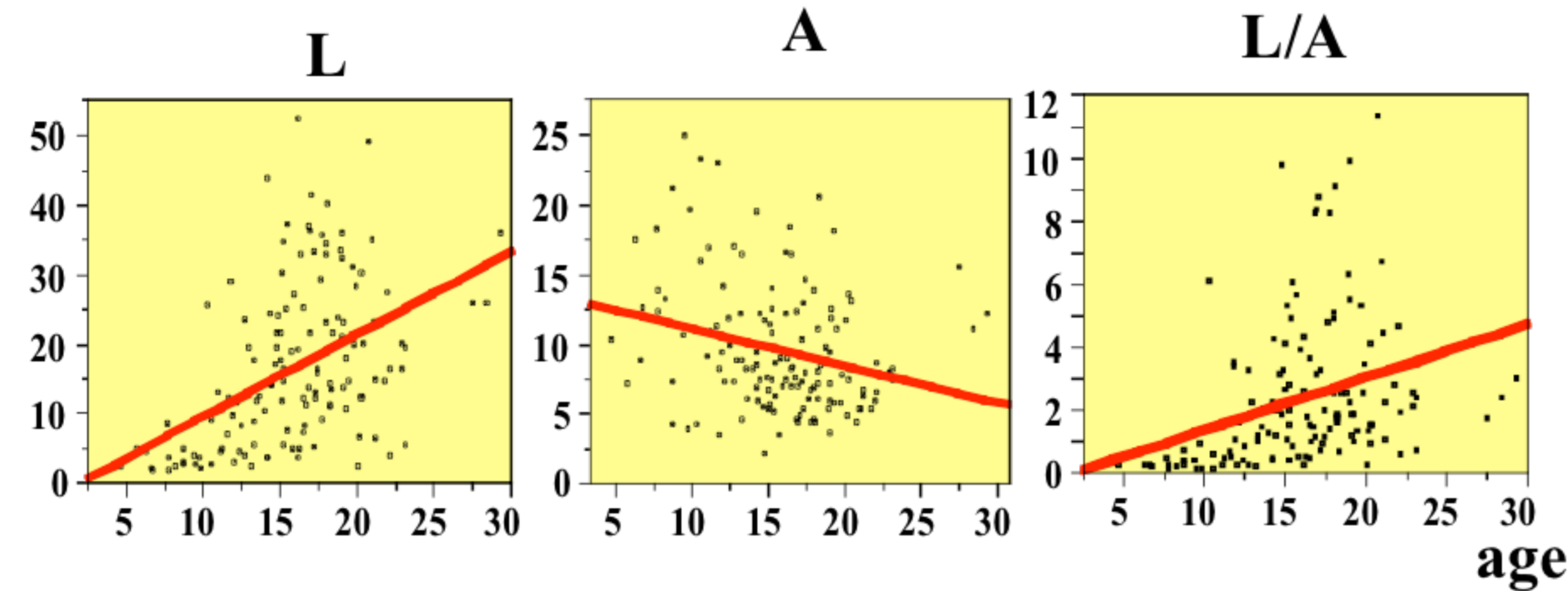


Fig.2

Relationship between Leptin, Adiponectin, L/A ratio and BMI

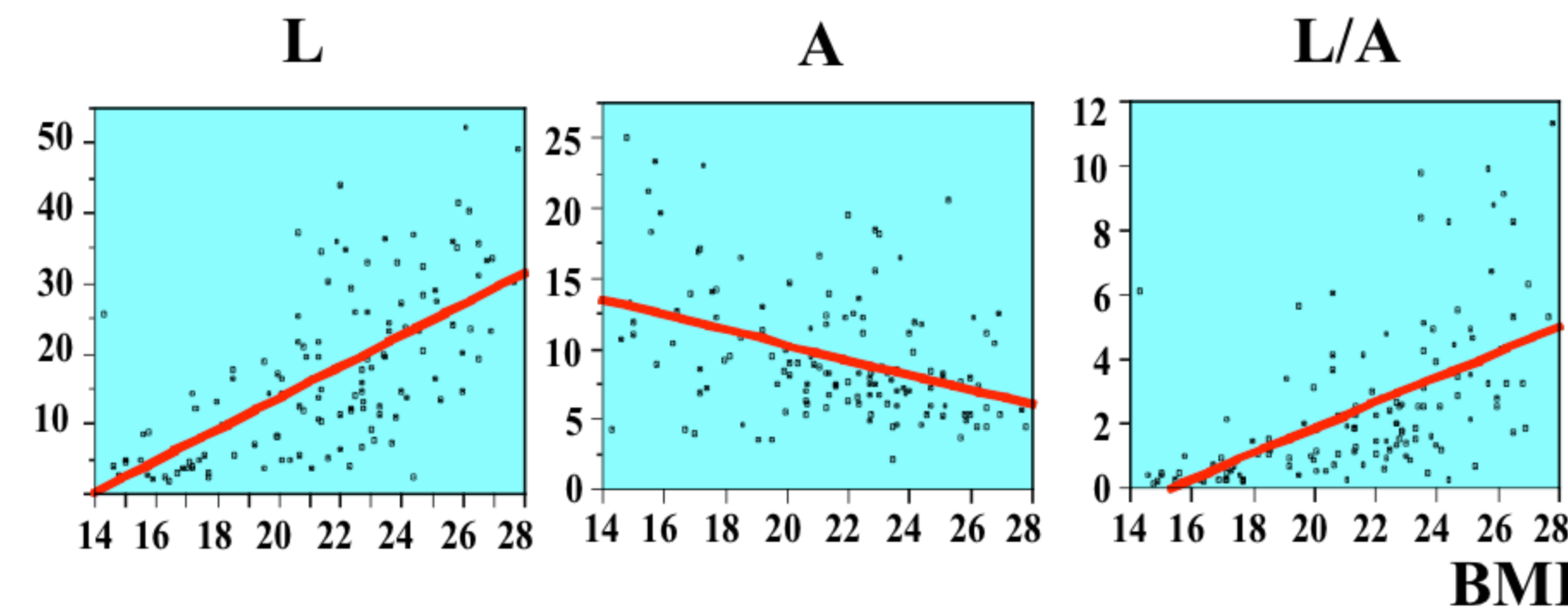


Fig.3

Obesity-related gene polymorphisms

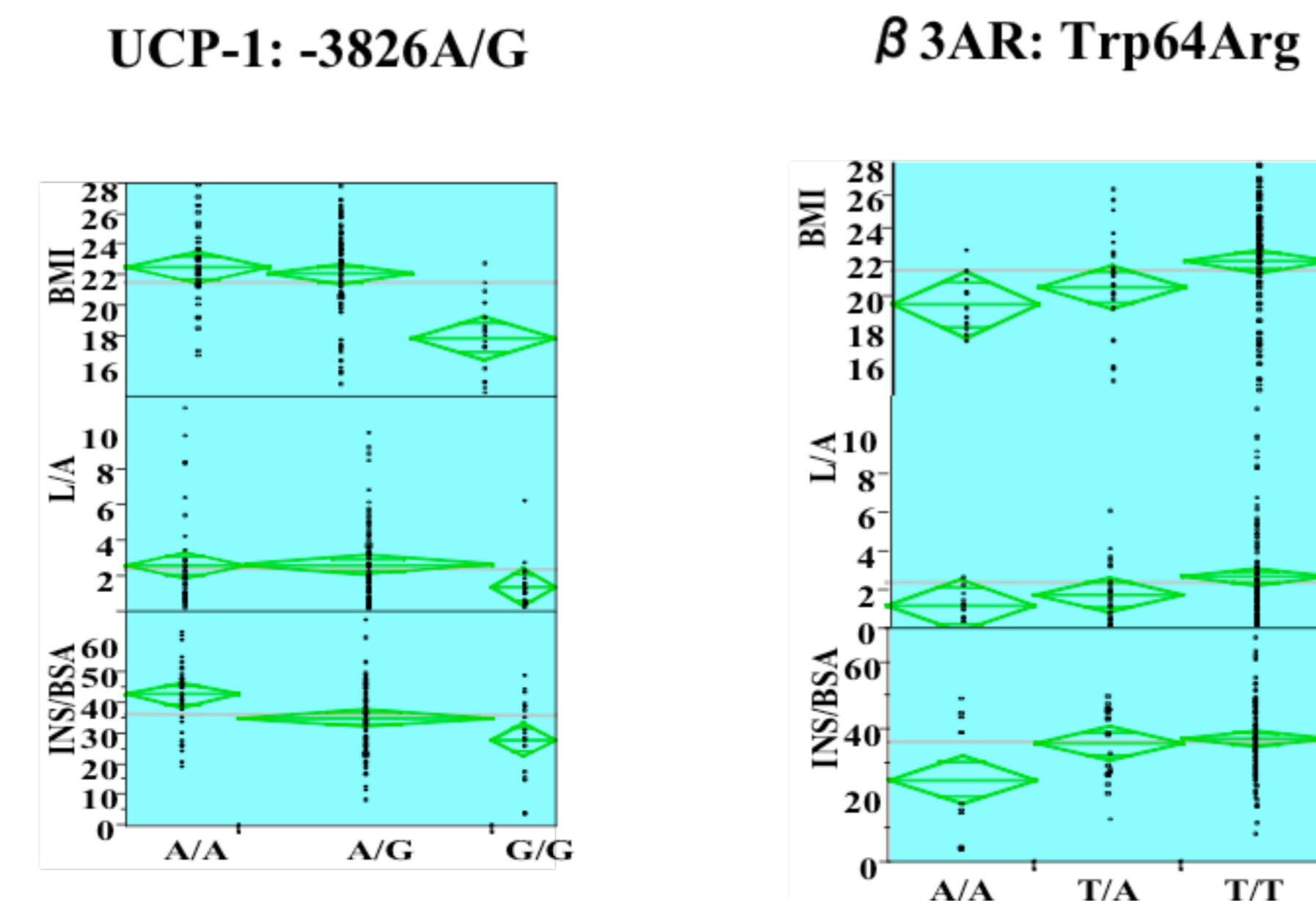


Fig.4

Serum adiponectin levels and adiponectin gene SNPs

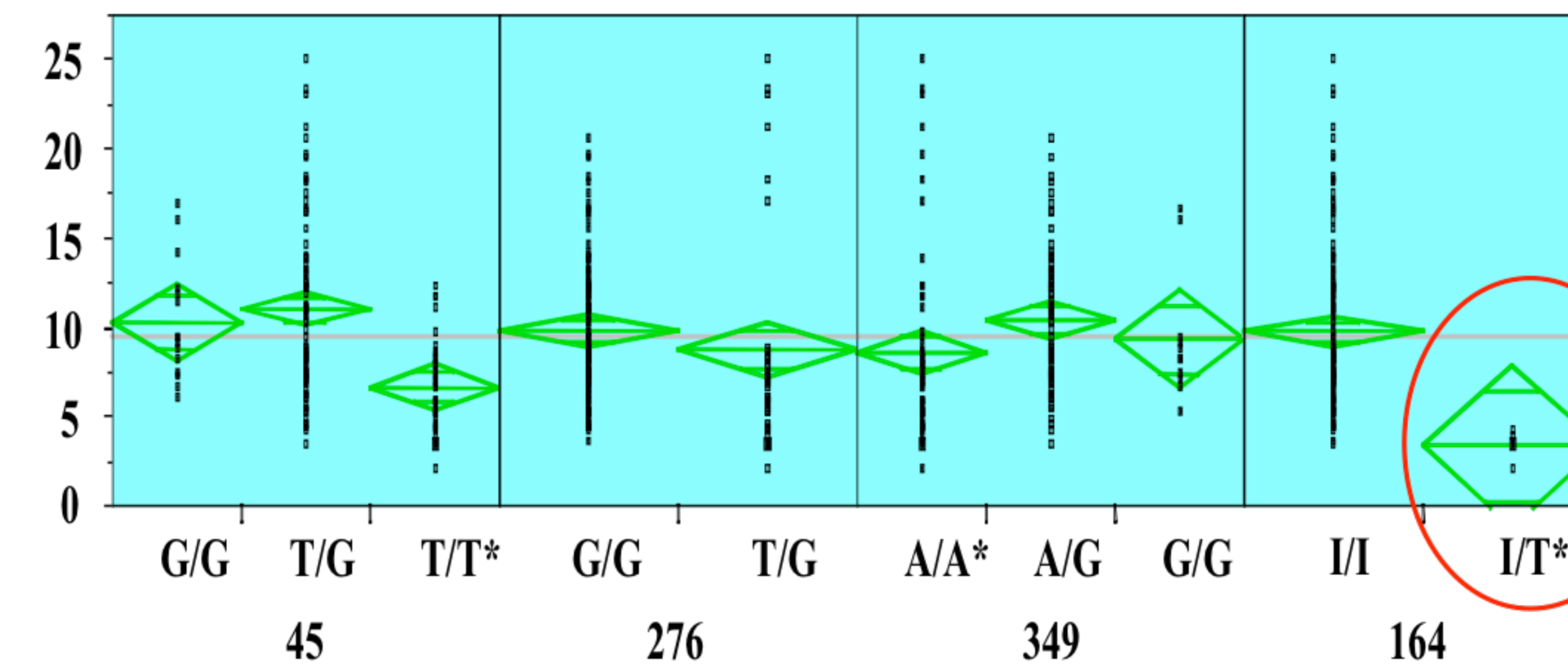
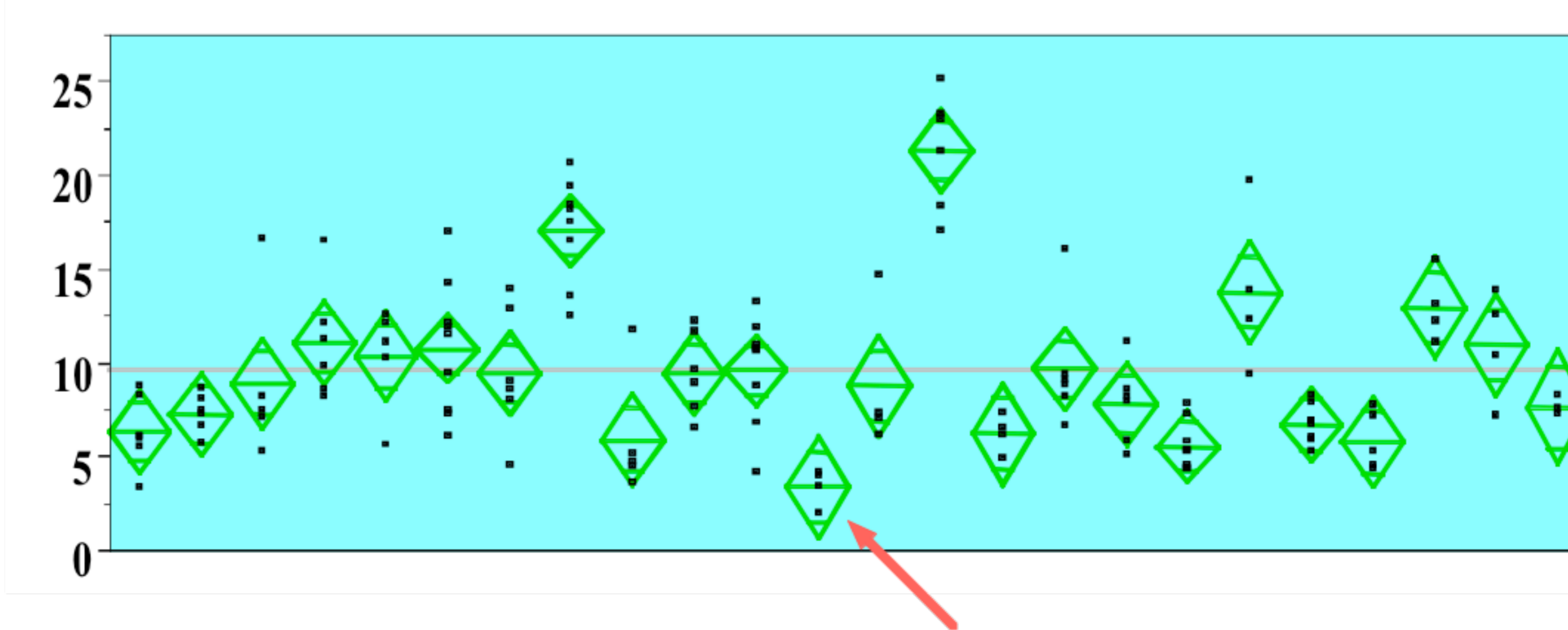


Fig.5

Serum adiponectin levels in all 24 patients



Results

- Serum adiponectin levels (mean: 9.60 ± 4.64g/ml) were negatively related with age (p=0.0025), BMI (p<0.001), systolic blood pressure (p=0.015).
- Serum leptin levels (mean: 16.6 ± 11.6ng/ml) were positively related with age (p<0.001), BMI (p<0.001), systolic blood pressure (p<0.001), insulin dosage (p<0.001).
- No significant correlation was found between serum adiponectin/leptin levels and HbA1C.
- The results of gene analysis for polymorphisms were as follows: UCP1(n=24); A/G(15), G/G(3), A/A(6), 3AR; T/T(17), T/A(5), A/A(2), AdipoSNP45; T/T(7), T/G(15), G/G(2), SNP276; G/G(18), T/G(6), SNP349; A/A(10), A/G(12), G/G(2), SNP164; I/I(23), I/T(1).
- The patients who had following gene polymorphisms (A/A and A/G in UCP1, T/T in 3 β AR, T/T in AdipoSNP45, A/A in AdipoSNP349) showed hyperleptinemia and hypo adiponectinemia.
- One patient who had a adiponectin gene SNP 164I/T showed extremely low mean serum adiponectin level (3.4 ± 1.4g/ml).

Conclusions

- In pubertal girls with T1DM obesity related dysadipocytokinemia appeared
- life-style intervention with weight control based on obesity-related gene polymorphisms will be important