

## Pioglitazone Improves Metabolic Markers in Patients with Type 2 Diabetes Independently from Physical Activities: Results from the IRIS III Study

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### Abstract

#### *Aim:*

Pioglitazone is an established peroxisome proliferator-activated receptor  $\gamma$  agonist for the treatment of insulin resistance in patients with type 2 diabetes mellitus. This analysis of the observational IRIS III study was performed to evaluate the effects of pioglitazone treatment in relation to the degree of physical exercise activities in a large patient population under daily life conditions.

#### *Methods:*

A total of 1298 patients out of 2092 enrolled into the IRIS III study who had provided information about their exercise level could be included in the final analysis (622 female, 676 male; age:  $63.1 \pm 10.4$  years, diabetes duration:  $6.6 \pm 5.0$  years, mean  $\pm$  SD). All patients were glitazone naïve prior to study entry. They received pioglitazone in addition to their previous oral antidiabetic treatment. The patients were stratified according to their physical activity level (never, sometimes, and regularly). Data were evaluated at baseline and after  $20 \pm 2$  weeks of treatment. Observation parameters were fasting blood glucose, lipids, and blood pressure. Hemoglobin A1c (HbA1c) was determined in a central laboratory, and insulin sensitivity was assessed by the IRIS II score.

#### *Results:*

Glycemic control, blood pressure, and the lipid profile improved independently from the degree of physical activity (e.g., no exercise vs frequent exercise:  $\Delta$ HbA1c:  $-0.89 \pm 1.2\%$  vs  $-0.72 \pm 1.1\%$ , not significant). A positive impact of exercise on insulin resistance could be observed at baseline, which, however, was further decreased by pioglitazone treatment [IRIS II score (baseline/end point): no exercise vs frequent exercise:  $74.0 \pm 15.9/62.5 \pm 20.2$  vs  $66.7 \pm 19.0/58.0 \pm 21.8$ ,  $p < 0.001$ /not significant].

*continued* →

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**Abbreviations:** (BMI) body mass index, (HbA1c) hemoglobin A1c, (HDL) high-density lipoproteins, (LDL) low-density lipoproteins, (PPAR $\gamma$ ) peroxisome proliferator-activated receptor  $\gamma$ , (TZD) thiazolidinediones

**Keywords:** diabetes, exercise, glitazones, metabolism

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**Abstract cont.**

**Conclusions:**

These observational results, obtained from a nonselected patient population under daily routine conditions, confirm that the benefits of pioglitazone treatment on glycemic control, lipid metabolism, and blood pressure are independent from physical activity. Exercise has a positive influence on insulin sensitivity, but pioglitazone shows additional favorable effects and is, therefore, recommended for use independently from the activity level of the patients.

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