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Association of Birth Weight with Diabetes
and Insulin Resistance among Community Residents

Abstract

Background

Low birth weight infants caused by intrauterine development insufficiency are known to have high risk of lifestyle-related diseases. In Japan, newborn infants' average birth weight has been decreasing since 1975.

This research evaluates the association between birth weight and type 2 diabetes and insulin resistance among residents of Japanese communities.

Methods

The population of this study consists of 7,575 men and women between the ages of 35 and 79 who attended the Okazaki Public Health Center from April 2007 to August 2011. Of those, 2,195 participants (979 men and 1,216 women) who answered the question “How much was your birth weight in grams?” were selected. Data on sex, age, BMI, fasting blood glucose, insulin concentration, and HOMA-IR were collected from the questionnaire, health check-up, and blood test. HOMA-IR, an index of insulin resistance ($\text{HOMA-IR} = \text{FBS} \times \text{insulin} / 405$), ≥ 1.6 was considered to be sufficient insulin resistance for the study.

Results

In men, a group with birth weights <2,500 grams and BMI ≥ 25.0 had a higher prevalence of insulin resistance than the group with birth weights 3,000-3,499 grams and BMI 22.5-25.0 (odds ratio, 7.37; 95% CI, 2.27–23.9). In women, a group with birth weights <2,500 grams and BMI ≥ 23.0 had a higher prevalence of insulin resistance than the group with birth weights 3,000-3,499 grams and BMI 20.5-23.0 (odds ratio, 5.62; 95% CI, 2.77–11.4).

Conclusion

Coexistence of low birth weight and present high BMI was associated with insulin resistance in both men and women.