

Plasma retinol-binding protein 4 and insulin resistance in overweight and obesity: effect of weight loss

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The adipokine retinol-binding protein 4 (RBP4) may contribute to the pathophysiological link between obesity and insulin resistance⁽¹⁾. The aim of the present study was to investigate whether plasma RBP4 mediates the improvement in insulin sensitivity following diet-induced weight loss.

Twenty-four overweight and obese subjects without diabetes (BMI 33.6 (SE 0.8) kg/m², age 39 (SE 2) years) were randomly assigned to consume one of two energy-restricted diets (low-carbohydrate or low-fat; twelve subjects per group) for 8 weeks. Throughout the intervention food was provided (in pre-weighed portions) to achieve a minimum weight loss of 0.5 kg/week.

Plasma RBP4 levels were measured before and after diet-induced weight loss using a commercially-available sandwich ELISA. Insulin sensitivity and body composition were also assessed by the euglycaemic–hyperinsulinaemic clamp and dual-energy X-ray absorptiometry scan respectively.

There was no significant between-group (twelve subjects per group) difference in weight loss or insulin resistance as a result of the diet assignment. For the group as a whole (*n* 24), RBP4 levels did not correlate with insulin sensitivity at baseline (*r* 0.16, *P*=0.48) or after diet-induced weight loss (*r* 0.07, *P*=0.75). Weight loss (7% decrease of initial body weight; *P*<0.01) significantly improved insulin sensitivity (by 13%; *P*=0.03) and reduced plasma RBP4 levels (by 17%; *P*=0.03). However, there was no correlation between weight-loss induced changes in RBP4 levels and the change in insulin sensitivity or between plasma RBP4 and measures of adiposity.

Variable	Pre-diet (<i>n</i> 24)		Post diet (<i>n</i> 24)		<i>P</i>
	Mean	SE	Mean	SE	
Weight (kg)	94.6	2.7	87.7	2.5	<0.01
BMI (kg/m ²)	33.6	0.8	31.2	0.7	<0.01
Body fat (%)	41.0	1.3	39.3	1.4	<0.01
Clamp glucose infusion rate (μmol/kg/min)	26.0	1.8	29.3	1.6	0.03
RBP4 (μg/ml)	30.4	2.2	25.3	1.7	0.03

In conclusion, weight loss following acute energy restriction is associated with a reduction in plasma RBP4 levels. However, the present study does not support a role for RBP4 in determining insulin resistance or influencing dietary-mediated modulation of insulin sensitivity.

1. Graham TE, Yang Q, Bluher M *et al.* (2006) *N Engl J Med* **354**; 2552–2563.