

## Combined Aerobic-Resistance Exercise Training and Broccoli Supplementation on Plasma Decitin-1 and Insulin Resistance in Men with Type 2 Diabetes

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**Abstract :** Exercise training and herbs supplement represent have role in the treatment for patients with type 2 diabetes (T2D). However, it is unclear combined effects of exercise training and herbs supplements on diabetic risk markers. This study aimed to determine the effect of 12 weeks of combined exercise and broccoli supplementation on decitin-1 and insulin resistance in men with type 2 diabetes. Forty-four type 2 diabetes men (age,  $48.52 \pm 4.36$ ) were randomly allocated to training-supplement (TS, n = 11), training- placebo (TP, n = 11), supplement (S, n = 11) and control- placebo (CP, n = 11) groups. The combined exercise program included 12 weeks, three sessions per week, that each session contained 45 minutes of resistance training with intensity 60-70% of one maximal repetition and 30 minutes aerobic training (running) with intensity 60-70% of maximum heart rate. In addition supplement groups consumed 10 grams of Broccoli per day for 12 weeks. Plasma Decitin-1, HOMA-IR, Insulin, glucose and body composition were assessed before and after training. Plasma Decitin-1, HOMA-IR, glucose and BMI significantly decreased in TS, TP and S groups compared with CP group ( $P < .05$ ). In addition Insulin and skeletal muscles mass showed significant increase in TS and TP groups compared with S and CP groups ( $P < .05$ ). It is concluded that both combined exercise training (aerobic-resistance) or broccoli supplement can improve plasma Decitin-1 and insulin resistance in two diabetic patients however combine of exercise training and broccoli supplement have more effective on these markers.

**Keywords :** broccoli supplements, combined training, decitin-1, insulin resistance, type 2 diabetes

**Conference Title :** ICEPSN 2020 : International Conference on Exercise Physiology and Sports Nutrition

**Conference Location :** Toronto, Canada

**Conference Dates :** June 18-19, 2020