Resveratrol supplementation

Calorie restriction-like effects in obese men

Tiziana Mennini

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Obesity is one of the risk factors for diabetes and cardiovascular diseases, and the main non-pharmacological intervention to prevent this deleterious condition is calorie restriction. However long-term dietary restriction is unlikely to have wide compliance, thus research on the development of calorie restriction mimetics has identified sirtuins, genes responsible for cellular energetic metabolism, as molecular targets. Resveratrol, a natural polyphenol present in different dietary components (peanuts, mulberries, grapes and red wine), is one of the strongest activators of SIRT1, affecting energy metabolism and mitochondrial function.

A randomised double-blind crossover study was done to verify, for the first time, the metabolic effect of resveratrol in obese men [1]. Twenty-two obese subjects, otherwise in good health, mean age 52 years, were randomised in two groups receiving placebo or 150 mg/day resveratrol for 4 weeks. Resveratrol significantly decreased sleeping and resting metabolic rate.

In muscle, the treatment with resveratrol activated AMPK, increased the levels of SIRT1 and PGC-1 α proteins, increased the activity of citrate synthase without change in mitochondrial content, and improved the mitochondrial respiration when a lipid substrate was used. Lipid levels were increased in muscle cells and decreased in the liver in subjects receiving

resveratrol. The treatment with resveratrol also decreased circulating glucose, triglycerides, alanine-aminotransferase and inflammation markers. Resveratrol significantly lowered systolic blood pressure and improved HOMA index, suggesting positive effects on insulin sensitivity. Adipose tissue lipolysis and plasma fatty acid and glycerol decreased during the post-prandial period.

The Authors conclude that 4 weeks of resveratrol supplementation induces calorie-restriction-like metabolic changes in healthy obese males, with no adverse events, although further studies are required to investigate the long-term and dose-dependent effect on the obesity-induced metabolic alterations.

A note of caution for people who plan to increase red wine consumption: resveratrol content in wine is too low (about 5 mg/l) to obtain the reported beneficial effects with a few additional glasses!

References

1. Timmers S, Konings E, Bilet L et al (2011) Calorie restriction-like effects of 30 days of resveratrol supplementation on energy metabolism and metabolic profile in obese humans. *Cell Metab* 14:612–622

Tiziana Mennini (✉)
Milan, Italy
tm@ceceditore.com