The aim of this study was to evaluate the effect of resveratrol administration on metabolic syndrome, insulin sensitivity, and insulin secretion. A randomized, double-blind, placebo-controlled clinical trial was carried out in 21 patients with metabolic syndrome in accordance with the IDF. Waist circumference and, glucose and insulin levels after a 75 g of dextrose load were measured. Triglycerides and HDL-cholesterol concentrations at baseline were also measured. Eleven patients received resveratrol (500 mg) three times daily before meals for three months. The remaining 10 patients received placebo at the same dose. Area under the curve (AUC) of glucose and insulin, total insulin secretion (insulinogenic index), first-phase of insulin secretion (Stumvoll index), and insulin sensitivity (Matsuda index) were calculated. The study protocol was approved by a local Ethics Committee and written informed consent was obtained from all volunteers. Intra- and inter-group differences were tested using the Wilcoxon signed-rank and Mann-Whitney U-test, respectively; p≤0.05 was considered significant. After resveratrol administration significant differences were observed in weight (94.4 ± 13.2 vs. 90.5 ± 12.3 kg, P=0.007), BMI (35.6 ± 3.2 vs. 34.3 ± 3.0 kg/m², P=0.006), fat mass (41.2 ± 7.9 vs. 38.8 ± 6.0 kg, P=0.001) and waist circumference (109.8 ± 9.3 vs. 105.4 ± 10.7 cm, P=0.004). There were also significant differences AUC of insulin (48418.5 ± 22707.4 vs. 26473.9 ± 8273.9 pmol/l, P= 0.003) and insulinogenic index (0.48 ± 0.22 vs. 0.28 ± 0.08, P=.004). In conclusion, resveratrol reduces weight, fat mass, waist circumference, AUC of insulin and total insulin secretion.