

# The Effect of Metformin and Insulin on Antiinflammatory High Density Lipoprotein in Type 2 Diabetes Mellitus

Alatas O.<sup>1</sup>, Akalin A<sup>2</sup>., Akalin G<sup>3</sup>., Erdogan I.<sup>1</sup>

<sup>1</sup>Department of Biochemistry, Eskisehir Osmangazi University, Medical Faculty, Eskisehir, Turkey

<sup>2</sup>Department of Endocrinology, Eskisehir Osmangazi University, Medical Faculty, Eskisehir, Turkey

<sup>3</sup>Department of Biochemistry, Faculty of Pharmacy University of Anadolu Eskisehir, Turkey

**Introduction:** Diabetes Mellitus is characterized with lipid, carbohydrate and metabolism disorders which caused by lack or resistance of insulin. Metformin is an antihyperglycaemic drug used to treat non-insulin dependent diabetes mellitus. Therefore, the aim of this study was to determine the resistance of HDL against oxidation which has an important role for the development of atherosclerosis in patients with type 2 DM.

**Method:** The study included 59 patients (35 female and 24 male; mean age 59±14 years) who were diagnosed as type 2 DM and used either metformin or insulin. Control group was healthy individuals. Blood samples were collected after overnight fast. Total-C, TG, HDL-C, LDL-C, Apo A, Apo B and Lp(a) levels were determined in clinical laboratory using routine standard methods. The ability of HDL to prevent oxidation of normal LDL was measured. Values > 1.0 (the value assigned for LDL oxidation in the absence of HDL) after the addition of HDL indicated proinflammatory HDL.

**Result:** TG [mean (SD) 207.96 (99.11) mg/dl] and Lp(a) [mean (SD) 58.42 (38.66) mg/dl] were higher in insulin group than in metformin [TG mean (SD) 174.03 (54.34) mg/dl]; Lp(a) mean 22.61 (17.31) mg/dl] and control groups [TG mean (SD) 121.15 (60.12) mg/dl]; Lp(a) mean (SD) 17.34 (11.98) mg/dl]. The patients had anti-inflammatory HDL but type 2 diabetes patients who used Metformin and insulin the antiinflammatory capacity of HDL were lower than controls but the antiinflammatory score of HDL were <1 all of the patients and controls.

**Conclusions:** In conclusion, we have demonstrated that the patients who were treated with insulin and metformin HDLs antiinflammatory capacity was similar to healthy control. These effects may indicate some clinical benefits of metformin and insulin in the treatment of these patients.