Modulatory effect of PPAR-gamma agonist pioglitazone on pre-osteoclast cells of Type2 diabetic subjects

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Background: Type2 diabetes mellitus (T2DM) have an increased fracture risk due to anti-diabetic medication use despite a higher bone mineral density (BMD) and increased risk of falls. Pioglitazone is currently the commercially (Actos) available anti-diabetic medicine, a class of Thiozolidinediones (TZDs). PPAR-gamma agonist pioglitazone may cause an increase in osteoclastogenesis in type2 diabetics resulting in reduced bone formation.

Aim: To find the effect of PPAR-gamma agonist pioglitazone on osteoclast cell formation derived from T2DM subjects.

Materials & Methods: Study subjects included (Group I) healthy subjects (n =10; M/F: 5/5), Group II T2DM (n=12; M/F: 7/5) and Group III (group II + pioglitazone treatment). Mononuclear cells isolated from peripheral blood from all the study subjects were cultured in an alpha MEM medium containing 10% FBS, 2mM glutamine, 25ng/ml M-CSF, 40ng/ml RANKL, 10mM dexamethasone in the presence of different concentrations of pioglitazone (2,4,6,8,10 μM) for 14 days. Cultured cells were stained for TRAP activity using a biochemical kit (Sigma).

Results & Conclusion: Pioglitazone stimulated PBMCs from type2 diabetics exhibited a significant increase in number of TRAP positive multinucleated osteoclast cells as compared to untreated cells.