

Press Release

Embargoed until Thursday, 23 September 09:31 CET

Thursday 23 September 09:00 – 10:30, Banting Hall

INSULIN INCREASES RISK OF FRACTURES BY LOWERING BLOOD SUGAR TOO MUCH AND INCREASING RISK OF FALLS; GLITAZONES INCREASE RISK OF FRACTURES THROUGH DIRECT ACTION ON BONE METABOLISM

In the third presentation, Dr Matteo Monami, from the Unit of Geriatric Medicine at the University of Florence and Azienda Ospedaliera Careggi, Florence, Italy, says that recent studies conducted by his team show that insulin treatment in patients with type 2 diabetes increases the risk of fractures, but only because it increases the incidence of hypoglycaemic episodes (dangerously low blood sugar) in patients, putting them at higher risk of falls, and therefore fractures. The insulin treatment does not, says Monami, directly affect bone metabolism. The glitazone class of diabetes drugs, by contrast, does weaken bones through direct action on their metabolism.

Interestingly, the increased risk of fractures associated with insulin treatment (due to hypoglycaemic episodes) occurred in men, who show a lower incidence of spontaneous fractures due to osteoporosis, and not in women. Monami says: "The greater impact of osteoporosis on the incidence of fractures among women could mask the effect of other risk factors, such as hypoglycemia."

Previous work has shown that patients treated with rosiglitazone (Avandia) experienced an increased risk of bone fractures. Monami and colleagues looked at the different insulin-sensitising agents (such as 'glitazones' and metformin) to see whether they had an effect on fracture risk. Both drugs reduce circulating insulin levels, and therefore could reduce the strengthening effect that insulin has on bone. However, the team recorded no association between metformin treatment and fracture risk, and thus concluded that insulin-sensitising drugs do not alter insulin's bone-strengthening effects. Monami says that this work supports the theory that glitazones instead exert their bone-weakening effects by direct action on bone metabolism, by promoting the conversion (differentiation) of stem cells into fat cells rather than bone cells. Glitazones also promote death of osteoblasts, the body's bone-forming cells, while metformin does not exert either of these effects on bone metabolism.

Monami concludes by saying that bone fractures are an extremely relevant factor in deciding the drug treatment plan for patients with type 2 diabetes. He says: "Bone fractures deserve to be considered among treatment outcomes for the choice of hypoglycaemic medication, particularly in older patients with type 2 diabetes."

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