INSULIN USE AND EXCESS FRACTURE RISK AMONG TYPE 2 DIABETIC PATIENTS: A PROPENSITY-MATCHED COHORT ANALYSIS

E. Losada-Grande[1] , B. Soldevila[2] , S. Hawley[3] , X. Nogués[4] , A. Diez-Perez[4] , D. Martinez-Laguna[5] , M. Puig-Domingo[2] , D. Mauricio[2] , D. Prieto-Alhambra[6]

[1] Medicine Department. Universitat Autonoma de Barcelona. Endocrinology section. Can Misses hospital, Ibiza, Spain, [2] Department of Endocrinology and Nutrition. University Hospital & Health Sciences Research institute Germans Trias i Pujol. Institute Research and Hospital Germans Trias i Pujol. CIBER of Diabetes and Associated Metabolic Diseases (CIBERDEM). Instituto de Salud Carlos III (ISCIII), Badalona, Spain, [3] Oxford NIHR Musculoskeletal Biomedical Research Unit, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford, Oxford, United Kingdom, [4] Department of Internal Medicine, Hospital del Mar-IMIM and Autonomous University of Barcelona, Barcelona, Spain, [5] Institut Catala de la Salut and IDIAP Jordi Gol, Barcelona, Spain, [6] MRC Lifecourse Epidemiology Unit, University of Southampton; MRC Human Nutrition Research, Elsie Widdowson Laboratory Oxford NIHR Musculoskeletal Biomedical Research Unit, University of Oxford, Southampton, United Kingdom

Objectives: Despite higher bone density, type 2 diabetic patients (T2DM) have increased fracture rates. T2DM medications could be involved in this excess risk. We investigated the association between insulin use and risk of bone fractures among T2DM patients.

Design and Population: Population-based matched cohort study.

Setting: Primary care records from the SIDIAP database (Spain).

Participants and Follow-up: All SIDIAP participants newly diagnosed with T2DM in 2006–2013 were eligible (n = 53,383). Patients aged <40 years, and those with secondary osteoporosis or severe kidney failure were excluded.

Exposure: Patients receiving at least two dispensations of insulin (two months of therapy) were classified as insulin users.

Outcome: Major osteoporotic fractures were ascertained using validated lists of ICD-10 codes.

Statistics: Propensity scores for insulin use were calculated using logistic regression models including the following a priori defined predictors of fracture: HbA1c, comorbidities, anti-osteoporosis and T2DM medications, lifestyle factors, fracture history, and index year. Insulin users were matched 1:5 with comparable non-users using propensity score calliper-matching.

Fine and Gray models were fitted to estimate the relative risk (sub-hazard ratio or SHR) of major fracture according to insulin use.

Results: A total of 2,979 insulin users and 14,895 non-users were observed for a median of 4.45 years. Major fracture rates were 11.2/1,000 person-years while on insulin therapy compared with 8.3 /1,000 among non-users. Adjusted models confirmed a significant association, an adjSHR of 1.43 [95 % CI 1.09–1.86] for major fractures. No differences between types of insulin or different regimens were found. Estimated numbers needed to harm were 71 (95 % CI 29 to 227) for major osteoporotic fracture.

Conclusions: Insulin use appears to be associated with a >40 % excess fracture risk among T2DM patients even in the early stages of the disease. Fracture risk should be included among the risks that are to be taken into account upon the decision to initiate new insulin treatment.