**Diabetic mellitus aggravates cortical bone status in aging mice**

**Portal-Núñez, JA, Lozano D, Proctor AM, van der Eerden BCJ, Schreuders-Koedam M, van Leeuwen JPTM, Mulero F and Esbrit P**

1. Bone and Mineral Metabolism Laboratory, IIS-Fundación Jiménez Díaz, UAM, and Spanish Institute of Health (RETICEF), Madrid, Spain
2. Department of Inorganic and Bioinorganic Chemistry, School of Pharmacy, Complutense University, and RETICEF, Madrid, Spain
3. ActiveLife Scientific, Santa Bárbara, CA, USA
4. Internal Medicine Department, Erasmus MC, Rotterdam, the Netherlands
5. Molecular Imaging Unit, CIMO, Madrid, Spain

**Introduction** Bone loss characterized by a decrease in bone mass and structure occurs with aging. Diabetes mellitus (DM), a prevalent condition in aged subjects, causes bone deterioration and an increased fracture risk. DM hampers osteoblast maturation and angiogenesis, associated with changes in bone microarchitecture and increased oxidative stress. However, the underlying mechanisms by which aging and DM produce bone deterioration are yet ill-defined. Here, we induced DM in old mice using a well-characterized protocol (multiple streptozotocin s.c. injections) aiming at exploring the consequences of combined aging and DM on cortical bone microarchitecture and vascularity in the mouse long bones.

References

**Methods** DM was induced in male CD1 mice (18 months-old) at 3 weeks after streptozotocin injections (45 mg/g BW, x5) (Old+DM). Mouse femora were scanned using a GE Locus xCT scanner. Tibiae were decalcified with osteosoft and then paraffin embedded. Four-micron thick sections were stained with haematoxylin and eosin, and the presence of blood vessels was assessed using a microscope (200× magnification) by two independent observers in a blinded fashion, and expressed as the number of vessels/mm² for each group. Results are expressed as mean ± SEM. Statistical comparisons between experimental groups were done by U-test (Mann-Whitney test using the GraphPad Prism V.4.0, software). Support: grants from the Spanish Institute of Health (PI01-0044, RD12/0043/0046, JC-2011-09548 and FPDI-2013-17268).

**Results**

**Micro CT analysis of mouse femoral diaphysis.** Ct. Th: Cortical thickness; Pm: perimeter; Ma. Ar: Medullary area. Data are mean±SEM (n=6). *p<0.05; **p<0.01 vs young control mice;

**Three point bending analysis of tibia from different group of mice.** Max. Load: Maximum load. MOI: Moment of Inertia. Data represent mean±SEM (n=6); *p<0.05 vs Young; **p<0.05 vs Old. DM: Diabetic;

**Conclusions** Our results indicate that DM aggravates the compromised cortical bone quality in Old mice, which might increase fracture risk in age-related osteopenia.

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