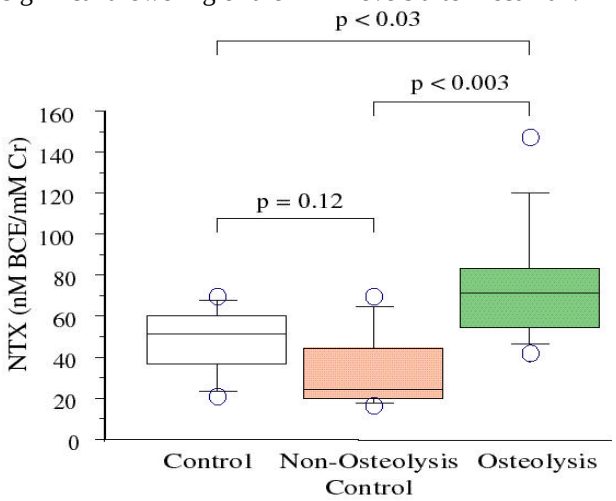
COLLAGEN CROSS-LINKED N-TELOPEPTIDES AS A MARKER FOR EVALUATING PARTICULATE OSTEOLYSIS

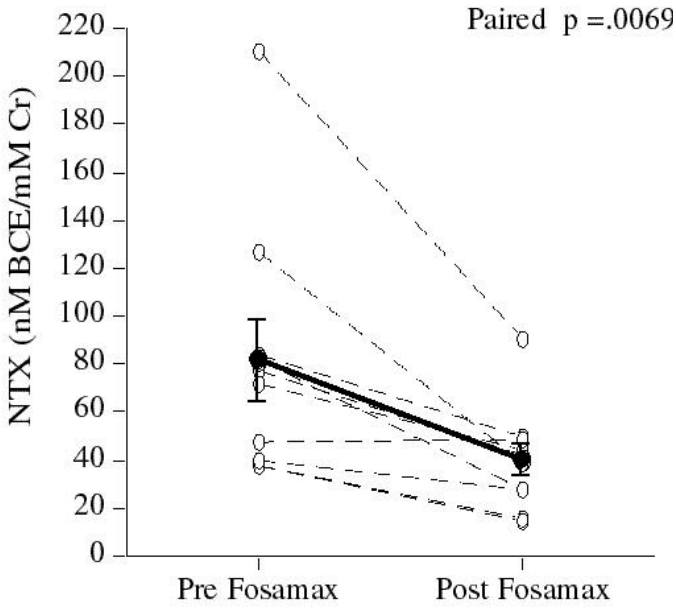
+*Antoniou J., Huk O., Zukor D., **Eyre D., Alini M. +*Orthopaedic Research Laboratory, McGill University, Royal Victoria Hospital, 687 Pine Ave., Room L4.69, Montreal, Quebec, Canada, (514) 842-1231 ext. 5383, fax (514) 843-1699, janton@orpla.rvh.mcgill.ca

Introduction: The purpose of this study was to identify a marker of bone resorption able to non-invasively diagnose and assess treatment of periprosthetic osteolysis. Cross-linked N-telopeptides of type I collagen (NTX) is a recognized marker of osteoclast-mediated bone resorption that has potential use in the clinical assessment of periprosthetic osteolysis.

Materials and Methods: Second morning urine was obtained from age-matched controls (n=7), hip arthroplasty patients with hybrid implants at least one year after surgery and with no osteolysis (n=8), hip arthroplasty patients with osteolysis (n=11) and arthroplasty patients with osteolysis pre and post 6 weeks of Fosamax (alendronate) treatment (each n=10). The Fosamax treatment consisted of one 10 mg dose per day for 6 weeks. Males and young (<50yrs) females were chosen as patients for this study to avoid post-menopausal change as a possible confounder. The average age of this cohort was 55±14 years. An ELISA technique for quantifying cross-linked N-telopeptides of type I collagen (NTX) was performed on all specimens.

Results: Our results indicate that the osteolysis group had significantly elevated levels of NTX as compared to the implant control group. In addition, the osteolysis patients had significant lowering of the NTX levels after Fosamax.





Discussion/Conclusion: These observations represent the first use of a biochemical marker (NTX) to evaluate particulate-induced osteolysis and its treatment. In addition, this study puts forth clinical evidence that osteolysis is associated with increased osteoclast-mediated bone resorption, and that particulate debris-induced bone resorption can be modulated through the use of certain bisphosphonates (Fosamax). These insights have potential value in our understanding and clinical management of aseptic loosening.

Acknowledgments: Canadian Orthopaedic Foundation, Merck Frosst Canada

Additional Affiliations: **University of Washington, Orthopaedics, Box 356500, Seattle, Washington 98195-6500

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