PRELIMINARY EVIDENCE FOR MENOPAUSAL BUT NOT ETHNIC OR SEASONAL DIFFERENCES IN BONE RESORPTION AS MEASURED BY SERUM C-TELOPEPTIDE: EARLY RESULTS OF THE D-FINES STUDY

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INTRODUCTION

•Bone turnover is a well studied phenomenon, however it is not clear as to whether bone shows a season driven rhythm over the course of the year.
•Some studies have found a significant seasonal variation in bone resorption markers e.g. Woitge, Knothe et al. (2000) and Hill, McCarthy et al. (2007).
•However other studies such as those by Blumsohn, Naylor et al. (2003)and Zittermann, Scheld et al. (1998) have found no evidence of seasonal variation in bone turnover markers.
•It is important to establish if bone turnover shows significant seasonal variation as this has practical implications in terms of the use of bone markers in diagnostics. There is also a lack of research into seasonal change in bone resorption in ethnic groups.

AIMS

•This study aimed to establish if bone turnover shows significant seasonal variation as this has practical implications for usage of bone markers in diagnostics.

METHODS

•The D-FINES study (Vitamin D, Food Intake, Nutrition and Exposure to Sunlight in Southern England) investigated 373 Surrey Caucasian (C) and Asian (A) women every season over a 12 month period (2006-2007).

•A random sub-sample of premenopausal C (n 18) and postmenopausal C (n 17); premenopausal A (n 13) and postmenopausal A (n 17) with blood samples for all seasons were selected.

•Serum CTX was determined by electrochemiluminescent immunoassay (Roche cobas e411 automated analyser).

RESULTS

•As shown in figure 1, a mixed between-within subjects ANOVA showed there was no significant main effect of season $F(3,59.0)=1.467$, $p=0.233$.

•However, there was a significant between subjects effect of group $F(3,61)=3.099$, $p=0.033$, with post hoc tests showing significant differences between the two C groups ($p=0.007$) and between the postmenopausal A and premenopausal C groups ($p=0.042$) but no significant differences between the other groups.

•Last, there was no significant interaction between season and group $F(9,143.741)=0.540$, $p=0.843$.

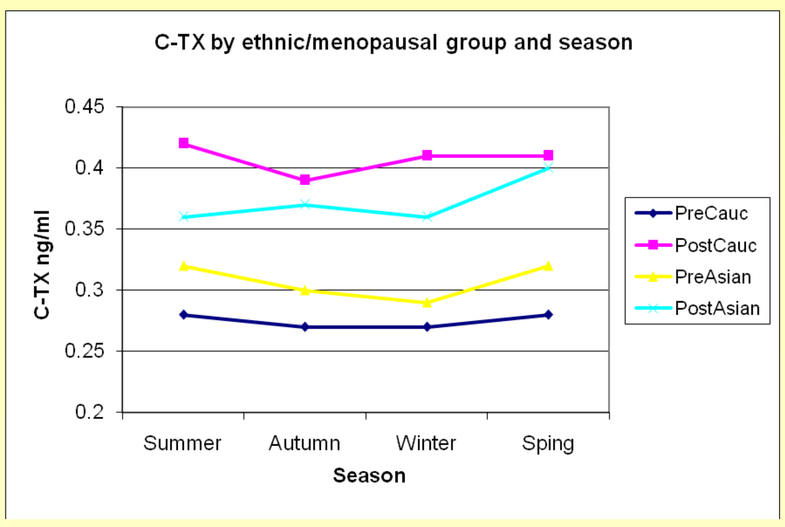
•The lower sCTX in the younger premenopausal groups is as would be expected.

•However, unexpectedly, there was a non-significant trend in the postmenopausal groups for the A women to have a lower mean sCTX than the C women. In contrast, in the premenopausal women, the sCTX was lower in the C group.

•Therefore it appears that it is menopausal status, not ethnicity which is likely the main reason for the group differences.

•Indeed, there was no significant difference between ethnic groups of the same menopausal status.

Figure 1



DISCUSSION

•Overall, no evidence for a seasonal variation in bone resorption was found here but there was evidence for a menopausal difference in bone resorption.

•However, numbers of participants in this preliminary analysis was small, and the trend for an ethnic difference in the postmenopausal women might be statistically significant with higher subject numbers.

•Further analysis with a larger sample is planned

REFERENCES

Blumsohn, A., K. E. Naylor, et al. (2003). "Absence of marked seasonal change in bone turnover: a longitudinal and multicenter cross-sectional study." J Bone Miner Res 18(7): 1274-81.

Hill, T. R., D. McCarthy, et al. (2007). "Seasonal changes in vitamin D status and bone turnover in healthy Irish postmenopausal women." Int J Vitam Nutr Res 77(5): 320-5.

Woitge, H. W., A. Knothe, et al. (2000). "Circaannual rhythms and interactions of vitamin D metabolites, parathyroid hormone, and biochemical markers of skeletal homeostasis: a prospective study." J Bone Miner Res 15(12): 2443-50.

Zittermann, A., K. Scheld, et al. (1998). "Seasonal variations in vitamin D status and calcium absorption do not influence bone turnover in young women." European Journal of Clinical Nutrition 52(7): 501-506.

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D-FINES Vitamin D, Food Intake, Nutrition and Exposure to Sunlight in Southern England