Hip geometry and cortical index in Greenland hip fracture patients and the possible influence on hip fracture occurrence

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Background

Osteoporosis is a debilitating disease associated with fractures, pain, disability, premature death and marked costs on society. Osteoporotic fractures occur at forearm, spine and hip with predominance in the 6th, 7th and 8th decade respectively. Increasing life span among Arctic inhabitants calls for attention to the occurrence of fragility fractures. Inuit is a distinct ethnic group that differs in body build and BMI. Thus, the research questions are: Do differences in body build carried through to bones? If so, does this influence the risk of osteoporotic fractures?

Methods

We retrieved radiographs of 200 patients admitted to the Orthopaedic Department at Queen Ingrid's Hospital, Nuuk, Greenland for a hip fracture. We evaluated collodiaphysial angle, femur neck length, outer and inner diameter of femur, cortical thickness, and cortical thickness index at 2 and 5 cm below the lesser trochanter.

Results

We here include results from the first 37 evaluations. Median height/weight was 165cm/68kg in men and 154cm/56kg in women. Mean age was 67/74y in men/women. Collodiaphysial angle was 137.5 o/136.1o in men/women and femur neck length was 38.5/34.9 mm (p=0.012). At 5 cm below the lesser trochanter outer/inner femur diameter was 29/15 mm in men and 25/15 mm in women with cortical thickness of 6,9 and 5,3 mm in men and women respectively (gender difference, p<0.001). The cortical thickness index in men/women was 0.49/0.36 (p=0.005) at 5 cm below the lesser trochanter. Cortical thickness index decreased with age (r -0.09, p=0.05).

Conclusion

Greenland patients were younger and smaller compared to those in Europe. Hip geometry in Greenland was in keeping with reference values for Caucasians. Gender differences were marked. Cortical thickness index was comparable to Scandinavians and decreased with age. This heralds increasing hip fracture frequency in the aging Arctic populations.