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**FORECASTING INCIDENT RADIOGRAPHIC KNEE OSTEOARTHRITIS FOR WOMEN: THE RELEVANCE OF HIP MORPHOLOGY AND BONE MINERAL DENSITY**

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**Objective**

To develop and internally validate a clinical risk model to predict incident radiographic knee osteoarthritis (RKOA) in a population-based cohort of middle aged women.

**Methods**

We followed-up 649 women (1,662 knees) with x-ray at baseline (year 1) and year 5 using community based cohort of women in London, UK, 1988-1994. The outcome was incident RKOA defined as Kellgren and Lawrence (K/L) grade 0-1 at baseline and $\geq 2$ at year 5. Bootstrap backward logistic regression analysis identified predictors of incident RKOA. Two models were generated: 1.a clinical model included patient measures, medication, wet biomarkers and knee symptoms; and 2.a model adding radiological variables. Models performance was assessed by calibration and discrimination.

**Results**

Univariable analysis found 33 of 105 factors associated with incident RKOA (p<0.20). The clinical model identified age, quadriceps circumference and cartilage degradation markers (serum cross linked C-telopeptide of type II collagen) as predictors. After including radiological variables (radiological model), the predictors of outcome were older age, higher quadriceps circumference, knee pain, knee baseline K/L grade 1 (versus grade 0), higher hip $\alpha$-angle, higher z-score bone mineral density (BMD) at the spine L1-L4, and contralateral RKOA at baseline. Calibration statistics showed high level of agreement. The area under the curve (AUC) for the clinical model was 0.692, reaching 0.797 in the radiological model.

**Conclusions**

We have developed and internally validated two models predicting incident osteoarthritis in short term (4 years). The most powerful prediction is related to radiological variables including hip morphology and BMD as important predictors. This points to a RKOA origin beyond the knee area and are potentially useful for clinical and epidemiological studies.