

## OSTEOARTHRITIS

## Metabolic syndrome and risk of knee OA

Previous studies have suggested that metabolic syndrome is associated with an increased risk of knee osteoarthritis (OA). However, an analysis of data from the Framingham OA Study, a substudy of the Framingham Heart Study, has revealed that neither metabolic syndrome nor its components, with the exception of hypertension, are associated with incident OA after adjustment for BMI or body weight.

Metabolic syndrome and its relationship with heart disease has been a major focus of the Framingham Heart Study. Measurements of metabolic syndrome, along with information about the development of OA, enabled Niu *et al.* to assess the relationship of metabolic syndrome and its individual components (which include central obesity, dyslipidemia,

“...most [associations between metabolic syndrome components and knee OA] were attenuated after adjustment for BMI...”

hypertension and impaired fasting glucose) with the risk of knee OA. They were also able to adjust for body weight or obesity — an important consideration given the strong relationship between obesity and occurrence of metabolic syndrome.

The longitudinal study analysed data from 991 individuals aged  $\geq 40$  years (mean age 54.2 years) without prevalent radiographic knee OA at baseline (1992–1995) who returned for a follow-up assessment 10 years later. Assessment of metabolic syndrome and its components was performed  $\sim 1$  year before the baseline OA examination. According to US National Cholesterol Education Program Adult Treatment Panel III criteria, 26.7% of men and 22.9% of women in the study had metabolic syndrome, although data was not

available to account for changes in metabolic syndrome or its components over the follow-up period.

At follow-up, the incidence of radiographic OA was 9.8% in men and 10.5% in women, and the incidence of symptomatic OA 6.3% in men and 7.2% in women. Preliminary analysis indicated that metabolic syndrome was associated with radiographic OA in men and with symptomatic OA in women, and the presence of more individual components of metabolic syndrome was associated with radiographic and symptomatic OA in both men and women. However, these trends were not statistically significant after adjustment for BMI or body weight.

Individual components of metabolic syndrome, in particular abdominal obesity, were also associated with incident knee OA, but most of these associations were attenuated after adjustment for BMI or body weight. Only hypertension (specifically, increased diastolic blood pressure) remained associated with an increased incidence of symptomatic knee OA in both sexes. Surprisingly, Niu *et al.* found that a high fasting blood glucose level was inversely associated with the incidence of symptomatic knee OA, whereas a positive association had been noted in earlier studies. Hypertension has previously been linked with OA, and Niu *et al.* suggest this association warrants further study.

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**ORIGINAL ARTICLE** Niu, J. *et al.* The metabolic syndrome, its components and knee osteoarthritis (OA): The Framingham OA Study. *Arthritis Rheumatol.* <http://dx.doi.org/10.1002/art.40087> (2017)

**FURTHER READING** Zhuo, Q. *et al.* Metabolic syndrome meets osteoarthritis. *Nat. Rev. Rheumatol.* **8**, 29–737 (2012)

