Implications of a sex difference in osteoarthritis

Sir,

We have recently been studying results from examination of the left knee joint at necropsies in Liverpool. Osteoarthritic bone exposure at the patello-femoral articulation was found in 17 of 30 women (57%) aged 70 to 96 years but in only 4 of 27 men (15%) in this age range (chi-square with Yates’s modification 8.97; P<0.01). We have also observed that women are twice as numerous as men in patients from North Wales seeking surgical treatment for osteoarthritis of the hip. Our findings are in line with previous evidence for a sex difference in osteoarthritis.1 This might be attributable to sex differences in gait and skeletal morphology. Also the mean surface area of the patellar articular cartilage is smaller in women than in men,2 so that in women this tissue may have less ‘functional reserve’ against the effects of a degenerative process.

However, another possible explanation would be that there is an inherent sex difference in articular cartilage or in some other component of synovial joints. This possibility has implications for cartilage research. It is helpful if data from studies of cartilage and related tissues are presented separately for women and men. Current hypotheses about the pathogenesis of idiopathic osteoarthritis can then be tested for their ability to explain the sex difference in this disease.

Radin has suggested that the progression of cartilage degeneration to osteoarthritis may be influenced by the resilience of the subchondral bone.3 Following his suggestion, we have recently shown that progressive cartilage degeneration on the patellar surface can be related to topographical variation in patellar subarticular calcified tissue density.4 However, there is no significant sex difference in the subarticular density values at the two sites we studied.

Freeman and Meachim5 have reviewed evidence which suggests that degeneration of cartilage may be due to fatigue failure of its collagen fibre network. It is therefore pertinent that there appears to be a sex difference in the fatigue properties of this material.6 It would be of interest to know if there are any sex differences in the other mechanical properties of articular cartilage, its metabolism, its proteoglycan profile, and its enzymatic degradation, or differences in the wear-protective properties of synovial fluid.

G. MEACHIM, R. BARBARA PEDLEY
Department of Pathology,
Duncan Building,
Royal Liverpool Hospital,
Liverpool.

References
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G Meachim and R B Pedley

doi: 10.1136/ard.39.2.199

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