Arthritis and diabetes

Rowan Hillson

Arthritis has troubled mankind for millennia. The Royal Powder, Pulvis Basilicus, was made by mixing ‘Diagridium Ceruss of Antimony, Cream of Tartar, and Mercurius Dulcis... This Cathartic is likewise very proper for Rheumatick and Gouty persons, for whom it is best made into pills... They greatly dissolve the viscid lente of the Juices and prevent their settling upon the Joints for farther Mischief.'

This 18th century remedy which is, of course, poisonous, is one of thousands of treatments for joint pain.

A large American study interviewed people in randomly selected US households. Diagnosed arthritis was reported by 48.1% of people with diagnosed diabetes; 55.0% of those with both diabetes and arthritis had arthritis-attributable activity limitation (AAAL). After adjusting for age, sex, race/ethnicity, education level, body mass index, and physical activity level, prevalence ratios of arthritis with AAAL among people with diabetes were 1.44 (95% CI 1.35–1.52) compared with 1.21 (1.15–1.28) among those without diabetes.

Osteoarthritis

Type 2 diabetes was an independent risk factor for arthroplasty, hazard ratio 2.1 (1.1–3.8) after adjustment for age, BMI, and other risk factors in a randomly selected and age- and sex-stratified population-based cohort of 927 people aged 40–80 years followed for 20 years. People with type 2 diabetes had rates of total hip and knee arthroplasty of 17.7 (9.4–30.2) per 1000 person-years compared with 5.3 (4.1–6.6) in those without diabetes. In 2010, 443 underwent knee ultrasound. People with diabetes had more severe joint damage than those without diabetes.

A systematic review and meta-analysis including 49 studies concluded: ‘For 5788 patients with DM [diabetes mellitus], the mean OA [osteoarthritis] prevalence was 29.5±1.2%. For 645 089 patients with OA, the prevalence of DM was 14.4±0.1%. The risk of OA was greater in the DM than nonDM population (OR=1.46 [1.08 to 1.96], p=0.01), as was DM in the OA than non-OA population (OR=1.41 [1.21 to 1.65], p<0.0001). Among the 12 studies reporting an OR adjusted on at least the body mass index, 5 showed no association of DM and OA and 7 identified DM as an independent risk factor.’

Rheumatoid arthritis and psoriatic arthritis

On meta-analysis, people with rheumatoid arthritis were more likely to have both type 2 and type 1 diabetes. The pooled risk estimate of diabetes prevalence in case-control studies was OR 1.40 (1.34–1.47); for case-control studies it was RR 1.43 (1.38–1.47). Subgroup analyses found that having rheumatoid arthritis increased the risk of having type 2 diabetes, and, in case-control studies, of type 1 diabetes.

A cohort study of 48 718 people with rheumatoid arthritis and 40 346 with psoriasis or psoriatic arthritis found that, compared with non-affected controls, the adjusted hazard ratio for new-onset diabetes in rheumatoid arthritis was 1.5 (1.4–1.5) and 1.4 (1.3–1.5) for psoriasis or psoriatic arthropathy. A UK study found an increased risk of incident diabetes in psoriatic arthritis, psoriasis and rheumatoid cohorts when compared with age- and sex-matched groups without the corresponding conditions. When they adjusted for BMI, smoking and alcohol use, comorbidities and glucocorticoids at baseline, hazard ratios were 1.35 (1.09–1.61) in psoriatic arthropathy, 1.21 (1.15–1.27) in psoriasis, and 0.94 (0.84–1.06) in rheumatoid arthritis.

It appears that patients treated with a tumor necrosis factor-alpha (TNF-α) inhibitor have a reduced risk of developing diabetes – the hazard ratio for incident diabetes mellitus after adjusting for multiple covariates, including BMI, was 0.49 (0.24–0.99) compared with the never users. Another study found that, among patients with rheumatoid arthritis or psoriasis, the adjusted risk of diabetes was lower in people starting a TNF inhibitor or hydroxychloroquine compared with initiation of other non-biologic, disease-modifying antirheumatic drugs.

Charcot foot

Acute or repetitive joint trauma in people with severe neuropathy may cause arthritis. In Charcot foot: ‘The interaction of several component factors (diabetes, sensory-motor neuropathy, autonomic neuropathy, trauma, and metabolic abnormalities of bone) results in an acute localised inflammatory condition that may lead to varying degrees and patterns of bone destruction, subluxation, dislocation, and deformity.’

In one audit, 36% of patients recalled an episode of relevant prior trauma, and 12% had had surgery to the affected foot. Ulceration affected 35% of whom 20% had osteomyelitis.

NICE says: ‘Suspect acute Charcot arthropathy if there is redness, warmth, swelling or deformity (in particular, when the skin is intact), especially in the presence of peripheral neuropathy or renal failure. Think about acute Charcot arthropathy even when deformity is not present or pain is not reported.’

To confirm the diagnosis of acute Charcot arthropathy, refer the person within 1 working day to the multidisciplinary foot care service for triage within 1 further working day. Offer non-weight-bearing treatment until definitive treatment can be started by the multidisciplinary foot care service.

We still have much to learn: ‘Charcot foot syndrome is an uncommon complication of diabetes but is potentially devastating in its consequences. Outcome is made worse by widespread professional ignorance leading to delayed diagnosis, but it is also hampered by lack of understanding of its causes and lack of treatments with proven effectiveness, other than offloading.’
People with rheumatoid arthritis or with psoriatic arthritis appear to have an increased risk of developing diabetes which may be reduced by TNF inhibitor or hydroxychloroquine treatment.

Suspect acute Charcot arthropathy if there is redness, warmth, swelling or deformity in the foot. Refer the person within one working day to the multidisciplinary foot care service.

Don’t miss septic arthritis. Remember unusual organisms.

Dipeptidyl peptidase-4 (DPP-4) inhibitors can cause joint pain.

Does arthritis hinder your patients with diabetes from managing or monitoring treatment, or from exercising? Help them find solutions.

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References