Abstract
Diabetes is a multisystemic and multifaceted syndrome, and its clinical impact is wide ranging and varied. The musculoskeletal complications of diabetes, too cover a broad spectrum of joints and presentations. Relatively less attention is paid, however, to the diabetic knee. This communication describes the bidirectional relationship between diabetes and the knee, and the potential influence this may have on therapy.

Keywords: Diabetes, musculoskeletal complications, osteoarthritis, type 1 diabetes, type 2 diabetes.

Knee Disease in Diabetes
Osteoarthritis of the knee is relatively more common in persons with diabetes.\(^1\) Osteoarthritis of the knee in persons with diabetes is associated with delayed recognition of pain, rapid deterioration/progression, and worse post-operative outcomes as well.\(^2\) Vitamin D deficiency, a common occurrence in diabetes, may predispose to this. Other causes of monoarticular arthritis, such as gout, and sepsis are also more common in persons with diabetes.\(^6\) Pigmented villonodular synovitis, a rare form of knee arthritis, is known to be associated with type 1 diabetes.\(^8\)

Osteoarthritis is related to other components of the metabolic syndrome, including obesity and hypertension.\(^9\) Common pathophysiologic mechanisms, including hyperglycaemia, lipid dysregulation, obesity-based load on weight bearing joints, and chronic low-grade inflammation connect metabolic syndrome with osteoarthritis of the knee. The similarities in pathogenesis are so striking that a metabolic phenotype of osteoarthritis has been identified, separate from age-related and injury related phenotype.\(^10\)

Diabetes in Knee Disease
Diabetes, and its associated metabolic complications such as obesity, are more common in persons with osteoarthritis.\(^1\) Limited mobility and the suggestion to abstain from high intensity high impact lower limb exercises may prevent the patient from following a healthy activity/exercise regimen.\(^11\) This may lead to worsening of glycaemic control.

Management Issues
The advanced glycation end products (AGE) that accumulate in articular cartilage provide a molecular mechanism that links diabetes and the knee, through both pathophysiology and treatment.\(^9\) Achieving good glycaemic control, therefore, is imperative, both for diabetes care and knee care.

One must be aware of some of the possible musculoskeletal effects that can occur with glucose-lowering drugs, such as osteoporosis with pioglitazone, and atypical fractures with canagliflozin. Recent meta-analyses, however, negate these possibilities.\(^12,13\)

Management strategies for osteoarthritis may impact glucose control as well. Limited options for exercise, and use of corticosteroid therapy may precipitate hyperglycaemia, which should be managed proactively. Use of non-steroidal anti-inflammatory drugs (NSAIDs) associated with metabolic adverse effects, should be monitored carefully as well.

A Vicious Cycle
It is clear from the preceding discussion that diabetes and osteoarthritis knee may spring from the same metabolic soil, and propagate each other in a self-destructive manner. One must act with prudence to break this vicious cycle of metabolic and musculoskeletal dysfunction. Pragmatic lifestyle and pharmacological choices, with a focus on weight loss and glucose control, as well as musculoskeletal strengthening, will help interrupt this pathophysiologic process. The diabetic knee should be given due importance in both endocrine and orthopaedic circles.

References