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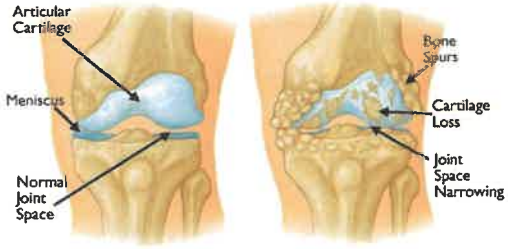
Link between Osteoarthritis and Type 2 Diabetes

What is Osteoarthritis?

Osteoarthritis (OA) is an inflammatory and degenerative joint disease, which mainly affects the knee, hip, spine, hands, and toe joints. In the United States, more than 20% of population over 50 years of age have OA and about 15% of this population will consult with their doctors about knee pain every year.



Causes and Risk Factors of OA

The cause of OA was mostly considered to be the result of "wear and tear" on the joints. The risk factors of overuse joint injury are kneeling, squatting, heavy lifting, and playing high impact sports such as football, soccer, hockey, and baseball pitching. With aging, the risk of developing OA increases. There are genetic factors, too. People who have family members with OA are more likely to develop OA. Recently, immune system response has been thought to cause OA. Inflammatory substances which our body produces result in OA development following damage to the joints.

Link between OA and Type 2 Diabetes

There is a higher prevalence of OA in those with type 2 diabetes compared to those without. The association between OA and type 2 diabetes has been traditionally attributed to underlying shared risk factors of age and obesity. However, recent research has shown that type 2 diabetes can lead to the development of OA. The extra sugar in our body can attach to cells, which provides a toxic environment and inflammation in the joints. Due to the imbalanced blood sugar level, cells can die from oxidative stress. Therefore, type 2 diabetes can cause severe OA.

Joint Replacement and Type 2 Diabetes

Over the last 20 years, the rates of joint replacement were 17.7 per 1,000 person-years in patients with type 2 diabetes while 5.3 per 1,000 persons-years in those without. Type 2 diabetes can also have negative impacts on joint replacement outcomes. Type 2 diabetes may increase the risk of death after the surgery, the rate of infection, and the need for a revision.

Overweight and obesity increase risk for knee replacement surgery, while weight-reduction strategies could potentially reduce the need for knee replacement surgery by 31%.

Treatment for OA and Type 2 Diabetes

Physical activity is the first-line of intervention to decrease pain and functional limitations in OA and type 2 diabetes. The American College of Rheumatology strongly recommended aerobic and resistance exercises to those with OA in the lower limbs. The American Diabetes Association recommended lifestyle management as a fundamental aspect of diabetes care, which includes diabetes self-management, education and support, medical nutrition, and physical activity.

Exercise Guideline for OA and Type 2 Diabetes

- Aerobic activities at least 150 minutes total a week.
- Perform at least 3 days per week in 45-50 minute sessions
- Resistive exercises 2 to 3 times per week at light to moderate loads
- Stretch for 10 minutes 2 days per week
- Balance exercise for 15–30 minutes 2 days per week
- Aquatic Therapy or arm exercise can be affected for patients with knee and hip OA.

Limitation for Exercise Performance

A number of impairments associated with aging, OA and T2DM develop over many years as a consequence of sedentary lifestyle and poor eating habits. Physical inactivity is a contributor to these impairments and serves as a trigger for the vicious cycle of further impairments and additional physical inactivity. The presence of lower limb OA (hip or knee) can restrict the possibility to perform physical exercise.

Do Not Perform Exercises When You Have:

- Moderate to severe joint pain
- Hypoglycemia-BG< 70 mg/dL
- Hyperglycemia-BG> 300 mg/dL with ketones

When those with OA and type 2 diabetes have difficulty performing exercises, they need tailored exercise programs for safe performance. Physical Therapists at IMG PT can prescribe individualized exercise programs for OA, type 2 diabetes, and aging with other comorbidities. If you have any questions or concerns about exercise programs for OA and type 2 diabetes, you can contact us.

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4. Clamshells

- Lie on your back with your feet together with TheraBand around BOTH knees.
- Slowly turn knees AWAY from each other, stretching the TheraBand around knees.
- SLOWLY return knees back to start position.
- Repeat 2 sets of 15. Perform 2 to 3 times a week.

5. Ball squeeze

- Place a rolled up towel, ball or pillow between your knees.
- Press your knees together so that you squeeze the object firmly.
- Hold 10 seconds and repeat 10 times. Perform 2 to 3 times a week.

6. Wall slide

- Lean up against a wall or closed door on your back.
- Slide your body downward and then return back to upright position.
- Repeat 2 sets of 15. Perform 2 to 3 times a week.

7. Heel Raise & Toe Raise

- While standing, raise up on your toes as you lift your heels off the ground.
- Repeat 2 sets of 15. Perform 2 to 3 times a week.
- In a standing position with your feet on the ground, raise up your forefoot and toes as you bend at your ankle.
- Repeat 2 sets of 15. Perform 2 to 3 times a week.

Exercise Program

When you are exercising on your own there are some things to remember....

◇ Any specific exercise that causes pain is hindering the healing process for your injury and should be modified or discontinued.

◇ Re-injuries during the rehabilitation process will slow your progress. If you get recurring pain either lower the resistance; lower the number of sets or repetitions; or reduce the range of motion to avoid the area of pain.

◇ Most exercises that do not involve the injured region can be done as long as the exercise does not increase the pain.

◇ When in doubt about how much weight to use for exercises, guess low. It is safer and easier to add weight than to hurt yourself with too much weight.

◇ Consult your Physician or Physical Therapist if any problems arise or if you have any questions regarding an exercise. It is better to make sure that you are doing an exercise correctly than to cause further injury by doing an exercise incorrectly.

Ice / Moist Heat for 15 minutes before / after exercising.

1. Walk for 30 minutes as tolerable 5 times a week.

2. Seated Hamstring Stretch

- While seated, rest your heel on the floor with your knee straight and gently lean forward until a stretch is felt behind your knee/thigh.
- Hold 10 seconds and repeat 10 times for both. Perform 2 times a week.

3. Seated Calf Stretch

- While sitting, use a towel or other strap looped around your foot. Gently pull your ankle back until a stretch is felt along the back of your lower leg. Maintain your target knee straight the entire time.
- Hold 10 seconds and repeat 10 times for both. Perform 2 times a week.