Knee Osteoarthritis

Maureen A. Stevens
Otterbein University, Stevens@otterbein.edu

Follow this and additional works at: https://digitalcommons.otterbein.edu/stu_msn

Recommended Citation

This Project is brought to you for free and open access by the Student Research & Creative Work at Digital Commons @ Otterbein. It has been accepted for inclusion in Nursing Student Class Projects (Formerly MSN) by an authorized administrator of Digital Commons @ Otterbein. For more information, please contact digitalcommons07@otterbein.edu.
Knee Osteoarthritis
Maureen A. Stevens, RN BSN
Otterbein University, Westerville, Ohio

Pathophysiology

Osteoarthritis (OA) is a common age-related disorder of synovial joints that is classified as a non-inflammatory joint disease (Ling & Batson, 2018). It is characterized by local loss of articular cartilage, bone formation of joint ends, subchondral bone changes, variable degrees of mild to severe, and thickening of the joint capsule (Ling & Batson, 2018).

Stages of OA

Stage 1: Normal/little
Stage 2: Slight/minor
Stage 3: Moderate
Stage 4: Severe

Signs

• Infusion
• Cartilage damage
• Internal/malalignment of the joint
• Swelling
• Cartilage abnormalities specific to knee OA

Significant Pathophysiology

• For primary care providers to adequately treat knee osteoarthritis, they must be able to understand the underlying pathophysiology.
• Osteoarthritis is a disease of cartilage. Cartilage is a flexible connective tissue with viscoelastic and compressive properties, which are impaired by its extracellular matrix, comprised predominantly of type II collagen and proteoglycans (Ling & Batson, 2018).
• In knee OA, cartilage matrix is seen in the extracellular matrix, losing its elasticity resulting in joint dysfunction and joint failure. In the cartilage, the loss of matrix elasticity is progressive, resulting in the loss of collagen and proteoglycans from the matrix (Ling & Batson, 2018).
• In response to loss of collagen and proteoglycans, chondrocytes initially proliferate and synthesize enhanced amounts of proteoglycans and collagen molecules. As the disease progresses, reparative attempts are outmatched by progressive cartilage degradation (Ling & Batson, 2018).
• The primary enzymes responsible for the degradation of cartilage are the matrix metalloproteinases (MMPs). These enzymes are secreted by both synovial cells and chondrocytes and are categorized into three general categories: collagenases, stromelysin, and gelatinases (Ling & Batson, 2018).
• In OA, synthesis of MMPs is greatly enhanced and the available inhibitors are overwhelmed, resulting in joint degradation. Stromelysin can serve as an activator for its own proenzyme, as well as for progelatinase and prostromelysin, thus creating a positive feedback loop of proMMP activation in OA (Ling & Batson, 2018).
• One candidate is interleukin 1 (IL-1). IL-1 is a pro-inflammatory cytokine that, in vivo, is capable of inducing chondrocytes and synoviocytes to synthesize MMPs. IL-1 can suppress the syntheses of type II collagen and proteoglycans, and inhibits transforming growth factor-β stimulated chondrocyte proliferation (Ling & Batson, 2018).

Diagnosing

OA diagnosis begins with a thorough history and physical examination. Specific questions to be asked include:

- Where and when started?
- What type of pain?
- Severity?
- Radiographic changes?

Treatment

Current treatment for OA is limited to control of symptoms. At this time, there are no pharmacological agents capable of retarding the progression of OA or preventing OA (Mansfield & Batson, 2018).

- Pain management
- Physical therapy
- Exercise
- Weight loss
- Medications

References


Implications for Nursing Practice

To aid in the symptom management of OA patients need to educate on non-pharmacological treatment methods involving:

- Exercise: Encouraging leg muscle strengthening exercises to help strengthen and protect the knee, boost activity levels, walking, cycling, or biking a few times a week.
- Cold and heat therapy: 20 minutes a day apply cold or hot compresses to inflamed joint every few days for pain.
- Stretching: Gentle stretching of joints may improve flexibility, softness and range of motion.

Conclusion

Knee OA is a commonly diagnosed disorder over 45 percent of the US population. It has an increasing occurrence in the aging population and coincides with many comorbidities such as obesity, heart disease, and diabetes (Ling & Batson, 2018).

This disease will be seen in the primary care setting and is imperative that primary care providers understand this disease and the pathophysiology behind it is order to properly treat these patients. Pain control and maintaining quality of life are key treatment measures to ensure patients can properly control their disease.

Author Information

Maureen A. Stevens, RN BSN
Otterbein University, Westerville, Ohio

Knee Osteoarthritis

Implications for Nursing Practice

To aid in the symptom management of OA patients need to educate on non-pharmacological treatment methods involving:

- Exercise: Encouraging leg muscle strengthening exercises to help strengthen and protect the knee, boost activity levels, walking, cycling, or biking a few times a week.
- Cold and heat therapy: 20 minutes a day apply cold or hot compresses to inflamed joint every few days for pain.
- Stretching: Gentle stretching of joints may improve flexibility, softness and range of motion.

Conclusion

Knee OA is a commonly diagnosed disorder over 45 percent of the US population. It has an increasing occurrence in the aging population and coincides with many comorbidities such as obesity, heart disease, and diabetes (Ling & Batson, 2018).

This disease will be seen in the primary care setting and is imperative that primary care providers understand this disease and the pathophysiology behind it is order to properly treat these patients. Pain control and maintaining quality of life are key treatment measures to ensure patients can properly control their disease.

Author Information

Maureen A. Stevens, RN BSN
Otterbein University, Westerville, Ohio

Knee Osteoarthritis