• **FACT SHEET No. 13**

Osteoarthritis Pain: Pathophysiology, Diagnosis, and Management

[Serge Perrot, MD, PhD]

Twenty percent of chronic pain worldwide is related to osteoarthritis (OA), with an increasing epidemiology related to age and obesity. For many years, OA pain has been neglected, with numerous false beliefs on mechanisms and treatments. Currently, it is associated with important unmet needs: specific assessment questionnaires for OA pain, effective and safe analgesics (especially in elderly patients), and in the case of replacement therapy, prevention of postoperative pain.

Pathophysiology

Pain is the major OA symptom, involving both peripheral and central mechanisms. OA pain is considered a prototypical nociceptive pain condition, and clinicians have expected that pain can be an alarm signal, correlated to the intensity of joint degradation. OA pain is initiated from free axonal endings located in the synovium, periosteum bone, and tendons but not in the cartilage. The nociceptive message involves neuromediators and regulating factors such as NGF (nerve growth factor), as well as central modifications of pain pathways.

In osteoarthritis, several studies have analyzed pain thresholds and pain sensitivity to different stimuli, confirming central sensitization. Thus, OA pain is a mixed phenomenon where nociceptive and neuropathic mechanisms are involved at both the local and central levels.

Diagnosis

- **Clinical features of OA pain**

OA pain may present with different clinical features: constant and intermittent pain with or without a neuropathic component or with or without central sensitization. OA pain perception is influenced by multiple environmental (e.g., weather conditions), psychological, or constitutional factors. Global assessment of OA can be provided by WOMAC or Lequesne questionnaires, which includes pain intensity assessment, but also joint stiffness and several items related to function. But it is always important to consider that OA pain intensity is not correlated to joint degradation.

- **Assessment of pain intensity in OA pain**

Pain intensity in OA is currently assessed by a numerical and visual analog scale. The McGill Pain Questionnaire (MPQ) has been validated in patients with hip and knee OA for more extensive analysis.

- **Specific questionnaires for OA pain**

A recent initiative from OARSI (Osteoarthritis Research Society International) and OMERACT (Outcome Measures in Rheumatology) has investigated several dimensions in OA pain through the ICOAP questionnaire (Intermittent and Constant Osteoarthritis Pain), which defines two distinct pain conditions in OA: intermittent and constant, with intermittent and intense pain having the greatest impact on quality of life.

Qualitative analysis of OA pain can be performed by the Osteo-Arthritis Symptom Inventory Scale (OASIS). OASIS is dedicated to characterize pain quality in OA and eventually will help define different phenotypes of OA pain.

Some authors have also tested the neuropathic component in OA pain by using painDETECT and the LANNS Pain Scale, confirming that OA pain should be considered a mixed pain, where precise clinical assessment may lead to specific therapeutic approaches.

Treatment of OA pain

There is currently no known cure for osteoarthritis, and treatment of pain represents a major part of OA management. Analgesic management should always combine pharmacological and non-pharmacological approaches.

- **Pharmacological approaches**

Most pharmacological approaches are considered ineffective and not very safe. Paracetamol is a commonly recommended drug in OA pain, but its analgesic effect is weak, and its safety profile is being reconsidered, especially in elderly patients. Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) are more effective but not safe for long-term use; some NSAIDs are used as topical treatments. The WHO analgesic ladder is not relevant in OA pain; weak opioids like codeine and tramadol are the drugs of choice for more intense pain, whereas strong opioids do not demonstrate greater efficacy and have safety issues, especially in elderly patients. Local injections (steroids and hyaluronate acid) may demonstrate analgesic effects, especially in treating knee pain.

- **Non-pharmacological approaches**

Non-pharmacological approaches represent the safer and probably more effective treatment of OA pain. These include numerous treatments, with heterogeneous validities. Exercises, especially aquatic strengthening and flexibility, have demonstrated important analgesic effects as well as functional improvements. Weight loss is effective for knee pain, and Tai-Chi, acupuncture, and TENS can be proposed.

Finally, surgery is an option in severe and intractable painful OA that is accompanied by important loss of function. In fact, though surgery is very effective in hip OA, several studies have demonstrated that 20 percent to 25 percent of patients with knee OA still have pain after surgery.

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