

Degenerative Osteoarthritis Revisited-Thinking outside the Box

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Commentary

As of 2013, osteoarthritis (OA) had affected 52.5 million people in the United States, approximately 50% of whom were 65 years or older. Current forecasts indicate that 78 million adults in the U.S. (26%) will have the condition by 2040 [1].

Among the many confusing ideas that surround OA is the matter of diagnosis. The current diagnosis standard, based on radiological findings, demonstrates a poor correlation between the number of individuals who have the condition and those who experience symptoms. For example, one radiological study of the knee found that while 28% of the population had the condition, only 19% had symptoms (e.g. pain, achiness, stiffness) [2]. Numerous additional studies show similar results and highlight a central issue related to the diagnosis of OA that joint structure cannot be relied upon as evidence for OA.

A second point of confusion concerns the classification of OA. Not all joints are equal; they should not be lumped together because to do so oversimplifies a complex health issue. Matters of structure, function, and environment influence the health of articular joints. Consequently, different circumstances influence the health and functionality of different joint. The pathological process is not identical, so discussing them as a singular condition leads to confusion, hindering the ability for health providers to focus on the relevant problems. Many review articles demonstrate such confusion.

As the name implies, OA is inflammation of an articular joint. The inflammation process is commonly believed to exhibit redness, heat, and swelling. However, in clinic, OA rarely exhibits these symptoms in finger, knee, or feet joints. Individuals recovering from traumatic injury or surgeries that have compromised joint integrity may experience such symptoms, but their conditions occupy a different category because of the additional circumstances.

While the joints of individuals suffering from OA are usually cold to the touch, they also produce uncomfortable levels of pain, evidence of inflammation that subsides to some degree when treated with anti-inflammatory medicine. The paradoxical nature of OA being cold but also inflamed and painful is of vital importance for devising effective therapeutic approaches.

The great majority of OA cases results from the degeneration of joints, a condition that increases with age and, in fact, is the major cause of disability in the aging population of the U.S. Not only are the affected joints in these cases cold to the touch, but they also become more painful in a colder environment. Warmth invariably brings down the pain level. Many attribute the problem to the “wear and tear” that comes with being older. However, most sufferers experience the greatest level of pain upon waking in the morning after having been at rest for an extended period of time and feel decreased discomfort after stretching and warming up. If age and the consequent “wear and tear” were indeed the cause of the condition, one would expect the pain to be much less after a good night’s sleep and plenty of rest. Many people believe, incorrectly, that a greater amount of use automatically leads to OA; in fact, extended periods of rest often increase symptoms for OA sufferers. These facts suggest that other causes are at play.

The coolness of the affected joints, in spite of the presence of inflammation, is not a trivial matter. It reveals the issue central to treating the degenerative effects of OA: namely, the inability for the joint to repair itself. Roughly, a decrease in temperature by 18° Fahrenheit cuts the metabolic rate by half. Force-feeding of oxygen and nutrients cannot change this body function. The warmth of the joints directly alters the body’s ability to function and heal when injured.

Every biological process, including tissue regeneration, is temperature dependent; obeying a fundamental physiochemical law articulated by the great physicist, Svante Arrhenius, 150 years ago [3]. As body temperature drops, every biological activity slows down. In cold conditions, consequently, a knee or finger joint has a greatly lessened capacity to repair itself. The joint needs the warmth in addition to good blood flow, as is evidenced, for example, by the reduced pain and greater comfort that sufferers commonly experience when they begin to move around in the morning.

The corollary to the influence of temperature is that anti-inflammatory medications like NSAID should not be the long-term remedy for degenerative diseases. Such medications suppress the very process vital to joint tissue reparation. The application of steroidal medication is even more detrimental to the regeneration of tissue at the joint.

Therefore, recognizing the absolute importance of warmth, one key remedy for OA, is to raise the temperature around the affected joints. While this treatment may seem simple, its effects are profound. OA sufferers who keep painful joints warm will enjoy their subsequent repair. Staying warm is critical for those who reside in extremely cold climates, particularly at night. Moreover, people living at high elevations or without heating devices are especially vulnerable as OA is rampant in these environments.

Very often OA occurs at the knees. Radiological diagnosis often site the uneven spacing at the joint, where one side of it is narrower than the other side, as an indication of OA, and excessive wear of the cartilage is identified as the culprit of the condition. But, such explanations ignore the role that uneven muscle tension plays and, thus, overlook the complete physical circumstances. Blaming excessive wear also fails to explain why the narrowing of the joint gap almost always occurs on the medial side (medial femur-tibial compartment narrowing) of the knee.

In clinic, most complaints of knee pain, hip pain, and leg pain involve the individual's shortened muscles on the medial side of the upper legs. Palpation will evoke pain at the medial-posterior aspect of the knee, at the insertion of the medial head of the hamstring muscle.

One crucial but often neglected fact is that, due to the naturally slanted positioning of the femur, the muscles on the medial side of the upper legs are under continuous tension. The affected muscles include the semitendinosus and the semimembranosus muscles as well as the adductors. The first

two insert into the tibia and cross over the knee joints. When these muscles shorten because of tension, the gaps on the medial side of the knee joints become narrower. The resulting structural imbalance causes many problems, including soreness around the knees, lower back pain, and hip pain. Few people realize that the tight iliotibial band (IT band) is due to this medial side muscle tension. Relief of the undue tension reduces the uneven pressure across the joint and will lead to even out the joint spacing. Strengthening the medial side muscles is key for solving the pain issues. Reducing the undue medial tension is key in resolving knee pain.

Incidents of OA are rising alongside the aging population, and the consequent suffering of individuals and the costs to society are staggering. Current courses of treatments are not working well, so a fresh look at the condition and a change in the therapeutic approach for addressing it are in order. Most importantly, adopting the easily implemented ideas explained above offers a potential reward that cannot be overstated: pain free joints at a minimal cost.

References

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