

Allodynia Misinterpreted as Mechanical Pain

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The International Association for the Study of Pain (IASP) defines allodynia as "pain due to a stimulus that does normally evoke pain." It is a very common experience to find that the spine is often very tender to palpation. Consider how often you have heard patients tell you their spine is especially tender and painful to palpation pressure that does not evoke pain in other regions of the spine. This happens to you every day. This phenomenon is called allodynia.

Isn't it also common for patients to tell you they avoid performing normal activities due to pain? Even though active range of motion is not significantly limited, patients will avoid normal movements due to pain. This also is referred to as allodynia.

Consider the apparent mechanisms that evoke allodynia, the first being a mechanical stimulus, and the second being a "mechanical" movement. It should not be a surprise that many in chiropractic, medicine, and physical therapy incorrectly refer to this as "mechanical" back or neck pain. There are even texts titled *Mechanical Low Back Pain*¹ and *Mechanical Neck Pain*.²

Waddell credits Fiddler for advancing the notion that pain is mechanical. In 1980, Fiddler surveyed members of the International Society for the Study of the Lumbar Spine (ISSLS). They described a pain syndrome in which movement caused pain in the absence of nerve root involvement, which became known as mechanical low back pain.³ You can see that the genesis of this term was not based on science; it was based on a poll of orthopedic surgeons and biomechanists who made up the majority of members, and not researchers who studied pain mechanisms.

Unfortunately, the term "mechanical pain" stuck and has taken a foothold in our minds, very much the way "subluxation" remains embedded in the minds of some. For those who are convinced mechanical pain is a real condition, it would be advisable to review the IASP's many proceedings from past World Congresses on Pain. The finest pain researchers in the world do not use the term "mechanical" to describe the nature of pain.

Mechanical pain is a clinical term used to describe the generation of pain in a moment in time; that is, palpation or movement causes pain, which is distinguished from nerve root pain that can be present with or without movement. Pain researchers do not utilize these terms.

Pain researchers typically refer to pain as being *nociceptive* or *neuropathic*. Nociceptive pain is pain caused by the stimulation of nociceptors due to damage or dysfunction of the tissue from which the nociceptors emanate. Conversely, neuropathic pain is due to damage or injury to the peripheral nervous system or the central nervous system.

The processes of both nociceptive and neuropathic pain are quite complex, and the description for each gets more complicated each year. For example, the IASP recently published a "Primer for

Clinicians" that no medical or chiropractic clinician can understand unless they have a PhD in neuroscience.⁴ Germane to the subject of this article is the first chapter of this so-called primer, which is devoted to mechanical stimuli, nociception and pain. In short, the fashion in which mechanical stimuli create pain is poorly understood; the authors state that "much remains to be determined regarding the molecular basis of mechanotransduction in nociceptors."⁵ In other words, we don't understand how mechanical stimuli cause sodium channels to open and cause action potentials in group IV afferents that lead to pain.

Also confusing to researchers, due to the complexity of molecular neurobiological research, is how local chemical changes alter the firing of group IV afferents. However, what has been known for a long time is that chemical mediators of inflammation stimulate group IV afferents, which can lead to pain. Numerous substances (bradykinin, hydrogen ions, cytokines, eicosanoids, etc.) bind to their respective receptors on the membrane of group IV afferents, which leads to the opening of sodium channels, and the generation of a receptor potential that may lead to an action potential.⁶

It is important for us to realize that the threshold for activation of nociceptors (group IV afferents) is typically quite high, such that the presence of the chemical mediators can progressively bring group IV afferents closer to threshold; a process referred to as peripheral nociceptive sensitization. When group IV afferents are biochemically sensitized, normal palpation and normal movements can cause pain, which leads to the illusion that pain is mechanical.

There is no simple way to describe the somatic pain syndromes we encounter. However, it should be clear that "mechanical pain" is far from being accurate from a physiological perspective. Allodynia, which can be interpreted as "mechanical pain," is due to the chemical sensitization of group IV afferents. A thorough read" of Byers and Bonica's chapter on nociceptor plasticity,⁶ which describes the sensitization and allodynic processes in great detail, would lead biomechanically inclined docs to reassess their perception of "mechanical pain."

References

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