Problems with pain—is the messenger to blame?

The nature and definition of pain has troubled mankind since the earliest times. To the ancient Greeks, pleasure and pain were closely linked ‘passions of the soul’, such that the absence of one led inevitably to the other, and vice versa. Two thousand years later, pain remains one of the great challenges facing modern rheumatology. Recent definitions, such as that adopted by the International Association for the Study of Pain,¹ have attempted to encompass the multidimensional character of pain by emphasising that it is not simply a sensory experience, but that it has important emotional and motivational components as well.

The subjective and private nature of pain means that it is often difficult to describe. Nevertheless, it is essential that the physician obtains a clear description in order to facilitate both diagnosis and assessment of response to treatment. Latterly, a number of techniques have been developed that evaluate pain indirectly using self rating scales, behavioural observational scales, and assessment of physiological responses.² Verbal and numeric pain rating scales, characterised by the visual analogue scale, quantify the intensity and magnitude of pain but do not consider other components. More descriptive scales, such as the McGill pain questionnaire, attempt to quantify these other components and have been widely used to study the effects of various methods of pain management. In clinical practice, however, the use of these instruments has proved less helpful, and the practitioner remains heavily dependent on a good clinical history.

In many patients, the origins of musculoskeletal pain are confusing, but experimental studies are now providing valuable insights into the mechanisms by which symptoms may arise. At least in part, the varied range of symptoms can be explained by the often complex relationship between the nervous system and the underlying disease. It is now appreciated that pain depends not only on tissue injury, if any, but also on functional changes within the nervous system.³ ⁴ Neural pathways are inherently plastic and can be extensively modified according to different conditions. The extent of these changes may well vary between individuals, and in some circumstances persist long after the initiating stimulus has resolved.

A key aspect of neuropathic plasticity involves changes to the sensitivity of individual neurones at both peripheral and central levels. Within the joint, injury or inflammation inevitably produce sensitisation and subsequent activation of articular sensory receptors. Different mediators released either by inflammatory cells or from sympathetic nerve terminals produce varying effects on these receptors.⁵ In many if not all arthropathies, the pattern of sensitisation and activation in the periphery is likely to be of pivotal importance in determining the character and magnitude of articular symptoms. It is particularly significant that large numbers of articular nerve fibres are non-responsive under normal conditions and only react following inflammation.⁶ Although direct proof is lacking, this may underly the use related or so called 'incident' pain that is experienced only on joint movement and is not present at rest. It is difficult to treat, as titration of a dose of drug adequate to provide analgesia during joint movement may result in unacceptable toxicity during pain free periods.

Sustained or repetitive activation of peripheral sensory nerves produces substantial changes to the function and activity of central neurogenic pathways.⁷ Once these changes are established, sensory processing is substantially modified and may result in new sensory modalities such as allodynia, whereby normally innocuous stimuli are perceived as being painful.⁸ Changes within central pathways may also be responsible for decreased pain thresholds over apparently normal tissues (secondary hyperalgesia) and for referred pain syndromes. A history of altered and often bizarre symptoms, increased numbers of muscle tender points, or the presence of trigger points may all indicate the presence of central hyperexcitability. At the spinal level, the importance of N-methyl-D-aspartate (NMDA) and neurokinin receptors in the genesis of these changes is now appreciated.⁹ Specific targeting of these receptors represents a novel analgesic approach that is currently receiving much attention.¹⁰ Endogenous opioids have an important inhibitory role, but concerns over inappropriate use continue to limit the use of opioids in musculoskeletal practice.¹¹

This edition of the Annals marks the start of a new series devoted to musculoskeletal pain. The first articles in the series review the pathophysiology of peripheral and central mechanisms and attempt to bridge the relatively wide gulf that still exists between experimental findings and clinical observations. The interplay between the environment, personality, and pain perception is then explored, as is the difficult issue of chronic musculoskeletal pain syndromes. The series concludes with an assessment of the suitability of specialised pain clinic techniques for use in more general situations, and the likely impact of novel therapies on treatment of musculoskeletal pain in the future.

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