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REFERRED PAIN

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ABSTRACT:

Purpose of this review: Referred pain is a common but less understood symptom that originates from somatic tissues. A comprehensive recognition of referred pain is important for clinicians when dealing with it. The purpose of this study is to summarize the current understanding of referred pain, including its pathogenesis, characteristics, diagnosis, and treatment. Recent findings: Referred pain arises not only from pathologies primarily involving local tissue but also from lesions in distant structures. Central sensitization of convergent neurons and peripheral reflexes of dichotomizing afferent fibers are two theories proposed to explain the pathological mechanism of referred pain. Because syndromes related to referred pain of different origins overlap each other, it is challenging to define referred pain and identify its originating lesions. Although various approaches have been used in the diagnosis and treatment of referred pain, including conservative treatment, blockade, radiofrequency, and surgery, management of referred pain remains a clinical challenge. Summary: Unlike radicular pain and

neuropathic pain, referred pain is a less studied area, despite being common in clinics. Referred pain can derive from various spinal structures, and blockage helps identify the primary pathology. Due to the heterogeneity of referred pain, treatment outcomes remain uncertain. Further studies are needed to improve our understanding of referred pain.

Introduction

In the field of somatic pain, most clinicians are familiar with radicular pain and neuropathic pain, but little is known about referred pain. Referred pain occurs in an area far from the primary lesion (1, 2) and is sometimes associated with secondary hyperalgesia and trophic changes in the referred areas (3). Although clinically common, the nature of referred pain remains an enigma (4–6). In most cases, pain in the dermatome regions, which are innervated by specific peripheral nerves, is simply regarded as radicular pain or neuropathic pain (1, 7). Referring to this phenomenon, the International Association for the Study of Pain (IASP), citing the classic treatise on pain, stated long ago in 2011 that "Pain in the lower limb should be described specifically as either referred pain or radicular pain" [sic] (2). In addition to the lower limbs, the diagnosis of pain in other somatic areas should also follow this guideline. Some researchers have even suggested that if the nature of pain is not clear, the diagnosis should not be jumped to Vulfsons et al. (7).

A better understanding of referred pain may help physicians in clinical diagnosis and decision-making, thus improving clinical outcomes. To this end, this review characterizes referred pain in various conditions and discusses possible pathological mechanisms and therapeutic measures based on the contributions of previous studies.

Conclusion

In this mini-review, patterns, and characteristics of referred pain from somatic structures are discussed. The similarity between referred pain and peripheral neuropathic pain makes it difficult to approach the diagnosis of referred pain. The main hypotheses for the pathophysiological mechanism of referred pain include central sensitization and peripheral reflex, which may jointly explain the development of referred pain. Convergence of sensory afferents at the subcortical level and dichotomizing afferents have also been proposed in scientific research. The overlap of referred areas from different somatic structures makes it difficult to locate the primary origins of referred pain. In clinical practice, local blockage and

radiofrequency are commonly used interventions in the diagnosis and treatment of referred pain, although there is a considerably high false-positive rate for both. Given the complex pathologies, changeable manifestations, and inconsistent distribution patterns, the treatment of referred pain remains a clinical challenge.

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