

Oxytocin: A New Painkiller?

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Abstract

Oxytocin is a peptide hormone released in our body. It plays a very well-known role in pregnancy-related uterine contractions and lactation. But oxytocin does a lot more than just helping women get through labour. Recent studies have shown that it contributes to pain perception and pain physiology. In this short article, we emphasize the potential role it has on pain relief and our aim is to promote the increase of researches about the subject.

Keywords: Oxytocin; Pain relief; Pain treatment; Endogenous oxytocin; Analgesia

Oxytocin (OT) is a neurohormone that has been mostly associated with pregnancy. Nevertheless, it is involved in many more pathways. OT travels from the paraventricular and supraoptic nuclei of the hypothalamus - where it is synthesized - to the rest of the body, activating and modulating a wide range of functions and emotions, including social behavior.

During the last decade, scientists discovered even more functions. One of them is its role in pain perception. It was found that oxytocin induces analgesia through different psychological and physiological processes. Oxytocin plays a dual role as a neurotransmitter in the central nervous system (CNS) and as a peripheral hormone. In the CNS, OT acts indirectly on the hypothalamic-pituitary-adrenal axis, through its effect on the amygdala, which reduces the release of cortisol levels. Subsequently, OT diminishes the influence of stress and anxiety in the nociceptive signaling, that is the main pain pathway. Additionally, it is considered that OT may interact with the central endogenous opioid system and therefore, produce analgesia and nociceptive effects [1]. There are few studies that evidence the role of OT in pain perception through somatosensory transmission, they suggest that low endogenous OT levels are associated to chronic pain conditions and increased pain sensitivity [2].

Russo and contributors reported that oxytocin-induced antihyperalgesic effect was only observed after central administration, as there were no results found with peripheral injections of exogenous oxytocin [3]. In addition, it is suggested that administered OT decreases beta endorphin plasma (endogenous opioid neuropeptide) levels and adrenocorticotrophic hormone, because of an interaction with corticotrophin releasing factor, which regulates the release of cortisol and beta endorphin [4]. Therefore, unlike endogenous OT, exogenous

or peripheral administered oxytocin would not contribute to pain relief.

Triggering our body to release this hormone could be a potential method for pain treatment. For example, sensory stimulation like touch and warmth, or even food. Furthermore, oxytocin may also be released by stimulation of other senses such as olfaction, [5] as well as by certain types of lights and sound [6]. This means that we could theoretically use this triggers to promote the biochemical pathway of Endogenous Central Oxytocin production. Thereby, these could be as an adjuvant to control chronic or post operative pain, also aid speedy recovery, help improve patients' well-being and improve their overall quality of life.

Nevertheless, clinical effectiveness and safety have not been studied yet. There is still a not very known area, so further research is needed, to determine whether if these interventions can be used as a new analgesic treatment, as they are a non-invasive, non-pharmacologic, but effective and inexpensive therapy to ease the pain.

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