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Mechanisms of acute and chronic pain after surgery: update from findings in experimental animal models.

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Abstract

PURPOSE OF REVIEW: Management of postoperative pain is still a major issue and relevant mechanisms need to be investigated. In preclinical research, substantial progress has been made, for example, by establishing specific rodent models of postoperative pain. By reviewing most recent preclinical studies in animals related to postoperative, incisional pain, we outline the currently available surgical-related pain models, discuss assessment methods for pain-relevant behavior and their shortcomings to reflect the clinical situation, delineate some novel clinical-relevant mechanisms for postoperative pain, and point toward future needs.

RECENT FINDINGS: Since the development of the first rodent model of postoperative, incisional pain almost 20 years ago, numerous variations and some procedure-specific models have been emerged including some conceivably relevant for investigating prolonged, chronic pain after surgery. Many mechanisms have been investigated by using these models; most recent studies focussed on endogenous descending inhibition and opioid-induced hyperalgesia. However, surgical models beyond the classical incision model have so far been used only in exceptional cases, and clinical relevant behavioral pain assays are still rarely utilized.

SUMMARY: Pathophysiological mechanisms of pain after surgery are increasingly discovered, but utilization of pain behavior assays are only sparsely able to reflect clinical-relevant aspects of acute and chronic postoperative pain in patients.

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