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   2023Y005

2. Title
   The Involvement of α7 Nicotinic Acetylcholine Receptor in Chronic Stress-Induced Pain Chronicity

3. Period
   2023-2025

4. Summary
   Psychosocial stress contributes not only to emotional disorders such as anxiety and depression but also to the onset and persistence of chronic pain, although the underlying mechanisms remain largely unclear. Chronic pain is considered a complex condition involving interactions between biological and psychosocial factors. In this study, we established a stress-induced chronic pain mouse model by combining repeated social defeat stress with a postoperative pain model, and investigated the involvement of spinal α7 nicotinic acetylcholine receptors (α7 nAChR). The model mice exhibited decreased mechanical pain thresholds and enhanced aversive emotional responses compared with non-stressed controls. Administration of the α7 nAChR agonist PHA-543613 significantly ameliorated both mechanical hypersensitivity and pain-associated aversive behavior. In addition, α7 nAChR expression was upregulated in the spinal dorsal horn of the model mice and was predominantly localized in neurons. Given that pain comprises both sensory and affective components, these findings indicate that activation of spinal α7 nAChRs improves both dimensions of pain. Collectively, spinal α7 nAChR may represent a promising therapeutic candidate for stress-induced chronic pain, with the potential to alleviate both pain perception and associated negative emotional states.