respectively). The results imply selective loss of calretinin-poor cochlear afferent fibers in aged cochlea. It also suggests that calretinin in cochlear afferent fibers might be utilized as a biomarker in distinguishing therapeutic target against age-related hearing loss.

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P08.18

Moxibustion treatment alleviates atypical pain in a rat model of Pre-rheumatoid arthritis through inhibition of P2X7 receptor function

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Objective: An interesting and unexplained feature of chronic pain in autoimmune diseases is the frequent separation between pain and inflammation. This is well illustrated in rheumatoid arthritis (RA). Joint pain may precede joint inflammation, even existed after successful anti-inflammatory treatment. In this study, we explored that P2X7R may lead to the development of pain under the early RA (Pre-RA) condition and explore the effects of moxibustion intervention.

Method: CIA rats were established and pain-like behaviors were monitored for up to 35 days. Pathological analysis of synovial tissue was performed. MRI was used to detect bone destruction, and western blot (WB) was used to detect the expression of P2X7R in tissues. Immunofluorescence was used to detect the localization of P2X7R in dorsal root ganglion (DRG) and spinal cord (SC). Electrophysiological techniques were used to detect cell excitability and synaptic transmission. Moxibustion intervention was started from the third week of modeling at Zusanli (both sides), Shenshu and Ashixue, lasted for 2 weeks with 20 min everyday.

Results: In the CIA rat model, P2X7R expression in L4-L6-related DRGs and SC was significantly increased in the second week and the fifth week after modeling. A438089 intrathecal injection significantly attenuated the pain behavior. The short-term effect was maintained for 4 h and the long-term effect was maintained for 48 h. The results of immunofluorescence showed that P2X7R in DRG was mainly expressed in satellite glial cells. Astrocyte was activated in SC. The excitability of the L4-L6 DRG cells and the synaptic transmission of SC are both statistically enhanced. After moxibustion treatment, the pain of CIA rats was improved, and synovial inflammation was alleviated. In addition, bone destruction was alleviated, and cell excitability and spinal synaptic transmission were reduced in CIA rats.

Conclusion: P2X7R mediates the pain of Pre-RA and plays an important role in the development of pain. Moxibustion treatment can effectively relieve pain and provide a new method for the management of RA pain.

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P08.19

Single unit activity of hand and neck sensitive pallidal cells in patients with cervical dystonia

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Cervical dystonia (CD), the most common form of focal dystonia is characterized by abnormal head posture combined with jerky or tremulous movements. One of the disorders theories suggests increased activity through cortico-striato-pallidal “direct” and “indirect” pathway as a cause of dystonia. Reduced pallidal output, changes in firing pattern and long-lasting inhibition induced by cortical stimulation was previously described. The aim of our study was to characterize single-unit activity of cells responded to voluntary movement of affected (dystonic) neck muscles and compare it with unaffected (clinically normal) hand movement and non-responsible cells. We used microelectrode recording from 12 CD subjects undergoing deep brain stimulation (DBS) surgery under local anesthesia. We analyzed activity of 36 neck- and 33 hand-sensitive neurons, as well as 192 non-responsible cells recorded from GPi and GPe. We found 48 excitatory and 21 inhibitory movement responses, which lead (28 cases) or lag (41 cases) the EMGs of hand or neck muscles. We showed that all cells were characterized by approximately the same firing rate (53–61 imp/s) but neck sensitive cells were significantly different in firing patterns. Activity of neck cells was more bursty with significantly higher oscillation scores in theta range. Then we classified cells by phasic and tonic responses and showed the differences in cell distributions between GPi and GPe. Neck cells with phasic responses were characterized by significantly lower firing rate (37-45 imp/s). Wherein in contrast to hand responses, tonic neck responses had an exponential decay with comparable to EMG decay time constant. Such decay in neuronal response was characterized by the time constant comparable to the one explained by previously described abnormal head neural integrator controlling head position.

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P08.20

A study of the arm movement feature visualization from non-human primate epidural electrocorticography using deep learning structure

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Brain–computer interface (BCI) helps the patient such as the quadriplegic to control of external devices by means of decoding patterns of electrical signals related by the movement on their brain cortex. Interestingly, there are research results related to the arm