



# Acupuncture on Neiguan spot: A promising therapeutic approach for atrial fibrillation by modulating autonomic nerves?

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## Opinion

Atrial fibrillation (AF) is one of the most common arrhythmias with high morbidity and mortality [1]. AF is frequently associated with heart diseases, autonomous nerve imbalance, hypertension, obstructive sleep apnea, inflammation, oxidative stress, and with a high prevalence in the elderly. Previous clinical and experimental researches have confirmed that cardiac autonomic imbalance plays a predominant role in the initiation and maintenance of AF [2-4].

In traditional Chinese medicine, Neiguan acupuncture has been used to treat cardiac arrhythmia and ischemia [5]. Multiple clinical evidences have demonstrated that Neiguan-acupuncture may be an effective approach for AF patients who underwent electrical cardioversion to restore sinus rhythm. The study by Federico Lombardi and his group [6] indicated that acupuncture of Neiguan has unequivocal effects in patients with persistent and paroxysmal AF.

The recurrence rate with acupuncture is similar with oral or intravenous amiodarone on persistent AF patient, but markedly lower than the sham group. In patients with paroxysmal AF, acupuncture significantly reduce the number and duration of episodes of AF. In Chinese researches, meta-analysis of two studies [7,8] showed that for individuals with AF, acupuncture on Neiguan point was shown to be as effective as intravenous amiodarone in conversion from AF to sinus rate. Another individual study has demonstrated that acupuncture on Neiguan spot plus intravenous deslanoside had better effect on response rate than intravenous deslanoside alone [9]. FAM Jonkmant's case report [10] favored the effectiveness of acupuncture on reducing the recurrence of AF, acupuncture could be a novel approach to treatment resistant AF. But the mechanism behind acupuncture on Neiguan spot needs further elucidation.

Autonomic nerve regulation may be one of the mechanisms of acupuncture on Neiguan spot in the attenuation of AF. Multiple clinical studies have illustrated that acupuncture of Neiguan spot has been shown to lessen nausea and vomiting which are related to vagal modulation, acupuncture of Neiguan spot could be a vagal

enhancer in healthy subjects [11]. Joanne W. Y. Chung's meta-analysis [12] supported the possible role of acupuncture on modulating the autonomic she found that LF, HF and LF/HF ratio of HRV significantly decreased. Tatsuo et al. [13] demonstrated that acupuncture on Neiguan spot reduced cardiac excitability and corrected the imbalance between cardiac sympathetic and vagal nerve activity during left stellate ganglion (LSG) stimulation in Yorkshire pigs. Anatomically, Neiguan spot is located on the nerve originating from LSG, the same ganglia that innervate the heart.

Stimulation of Neiguan spot may exert the function of regulating autonomic nerve. Another potential mechanism is about the central nervous system. Acupuncture of Neiguan elicits its cardiac effects by reducing the cardiovascular sympathoexcitatory reflex response. This effect is primarily achieved by inhibiting the rostral ventrolateral medulla to up-regulate inhibitory neurotransmitters such as GABA, opioids, 5-HT, NO and NOS [14].

Acupuncture's anti-AF effect may be related to the stabilizing sympathetic and vagus nerve control mechanisms, rather than direct anti-adrenergic or vagus nerve effects. Although the mechanism is not clear, it does not prevent us from applying it to the clinic. Our team is working on a bracelet that can continuously produce electrical stimulation to the Neiguan spot, which we hope can be used to treat AF. Therefore, we think that acupuncture on Neiguan spot could be a minimally invasive, economic and safe approach to attenuate AF.

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