

Possible effects of acupuncture on atrial fibrillation and post-herpetic neuralgia – a case report

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Abstract

A 72 year old female with a main complaint of severe post-herpetic neuralgia and a secondary complaint of atrial fibrillation (AF) received two series of acupuncture treatments totalling 20 treatments over a four month period. Her standard medical treatment remained unchanged. The primary focus of the acupuncture was pain relief; however, two acupuncture points (PC6, SP4) were included in both treatment series because of possible effects on both costal or chest pain and cardiac arrhythmias, according to Traditional Chinese Medicine (TCM) teaching and limited research. As recorded by her pacemaker, estimated weekly episodes of AF in the patient decreased significantly, and percentage time in AF decreased with borderline statistical significance, from the pretreatment estimates during the second series of treatments (weekly AF episode estimates: pretreatment =71.4; second series =16.5, difference estimates =-54.9, 95% CI -6.5 to -103.3, P=0.02; percentage time in AF estimates: pretreatment =30.6; 2 second series =18.0, difference estimates = -12.6, 95% CI 0.9 to -26.0, P=0.08). The pain levels were also significantly reduced following the acupuncture treatment series by more than 67%. Further studies are warranted to further explore these observations of a possible effect of acupuncture on both atrial fibrillation and post-herpetic neuralgia.

Keywords

Acupuncture, post-herpetic neuralgia, pain, herpes zoster, atrial fibrillation, cardiac arrhythmias, palpitations.

Report of a case

Little research has evaluated the effect of acupuncture on atrial fibrillation (AF). Data from implanted pacemakers in patients with AF provide a unique opportunity to evaluate any potential effect. However, to date, few studies, if any, have taken advantage of this opportunity.

We evaluated a patient for post-herpetic neuralgia (PHN) who had an implanted pacemaker to help monitor and manage her episodic AF. Pacemaker data logged over two courses of acupuncture treatment were evaluated to determine any possible effects of acupuncture on her AF as well as her chronic pain. Consistent with the principles of Traditional Chinese Medicine (TCM), in which a patient's main complaint is seen in the context of the whole body presentation including digestion, elimination, energy states, circulation, emotional tendencies, and the TCM tongue and pulse

evaluations, an acupuncture prescription was designed for this patient to address both her pain and episodic AF.

History and evaluation

A 72 year old woman was seen for a 13 month history of post-herpetic neuralgia. Pain was located over the right T5-T9 dermatomes, radiating anteriorly. At the time of her first acupuncture visit, she described the pain level at 6/10 with daily episodes of 10/10 pain lasting for greater than an hour. Pain was described as stabbing and burning. She also complained of severe skin sensitivity. Prior treatments included analgesics, a methylprednisolone dose pack, gabapentin, and four nerve blocks, all with minimal effectiveness.

Atrial fibrillation was initially diagnosed 20 years prior to her initial acupuncture visit, and was associated with a 'fluttering' sensation in her chest

and secondary anxiety as a result of this sensation. She was initially diagnosed by her primary care physician and then managed by a cardiologist with a combination of medications and, subsequently, with a pacemaker, which was implanted one year prior to the onset of herpes zoster and two years prior to her first acupuncture treatment. The pacemaker was a St Jude Medical Model #5386 (St Jude Medical Inc, St Paul, MN), programmed mode: DDD, with base rate 60ppm, maximum track rate 110ppm, and AT detection rate 200ppm.

Her past medical history included hyperlipidaemia, diabetes, and hypothyroidism. Medications were atorvastatin, glyburide, l-thyroxine, warfarin, digoxin, verapamil, gabapentin, amitriptyline, and calcium carbonate, and were unchanged for the time period of approximately 10 months prior to her first acupuncture treatment through five months after her final acupuncture treatment. A thyroid panel taken during the period of her acupuncture treatments was within normal limits. In addition to the prescribed medication for the pain, she found that ice applied to the painful areas (right costal to posterior mid-thoracic) numbed the pain and paracetamol (acetaminophen) gave very slight relief.

In addition to pain locations and levels as described, additional symptoms/signs relevant to a TCM diagnosis included fatigue with low energy levels; erratic sleep due to the pain; depressed and anxious mood as a result of persistent pain and awareness of the atrial fibrillation; irregularly irregular, slightly wiry pulse, and pale purplish, swollen tongue, with a thin white coating and two purple spots, one on each side of the tongue, just posterior to the tip.

Based on her evaluation, the TCM diagnosis was *Qi*/Blood stagnation (ST, SP, LR, GB, BL channels) with secondary *Qi* deficiency. Consequently, the treatment principle was to primarily move the *Qi*/Blood in the right chest, costal, and posterior lateral mid-thoracic area and secondarily to tonify the *Qi*.

The acupuncture points chosen were (RH side) SP4, PC6, LV3, GB34, SP10, ST36, TE6, LR13, LR14, BL40, BL15, BL17, and BL18 with very light plum blossom needling to cause local redness in the area of pain. The patient received nine treatments over five weeks from 10 February 2005 to 17 March

2005. There was then a two month hiatus due to the patient's lack of availability, following which she received an additional 11 treatments over six weeks, from 21 May 2005 to 22 June 2005. The treatment prescription in the second series was the same as the first with the addition of HT7 (LH side) because she complained of heightened anxiety and increased awareness of a 'fluttering' sensation in the chest.

The patient was informed during the initial visit that the focus of the acupuncture treatments was pain relief and that the treatments might also affect her energy level and symptoms associated with AF.

Local blood letting and electrical stimulation, which are standard TCM treatment for her type of pain,¹⁻³ were considered contraindicated because the patient was taking warfarin and had an implanted pacemaker. Instead, local very light plum blossom tapping and the combination of points SP4 and PC6 were added. The points SP4 and PC6 are known as open and coupled points of the extraordinary channel *Chong Mai*, which are thought to affect chest/costal pain and regulate the heart rhythm.⁴

Although the presence of her pacemaker precluded the use of acupuncture with potentially effective electrical stimulation, it proved to be very useful in monitoring the frequency of her AF episodes in temporal association with the acupuncture treatments.

Data collection and analysis

Pain levels were subjectively reported by the patient using a 10 point scale. The number of AF episodes per week and percentage time in AF per week were objectively measured by the pacemaker. The patient's AF history data were downloaded and evaluated at six monthly intervals at the Massachusetts General Hospital Pacemaker Clinic. These data enabled us retrospectively to analyse AF data: prior to, during, and after acupuncture treatments. The weekly time series of AF event counts and percentage time in AF were analysed separately in mixed first order autoregressive moving average (ARMA[1,1]) models with indicator variables as input series,⁵ identifying five intervals in the time series: (1) 180 to 1 day prior to the first acupuncture treatment; (2) the first acupuncture treatment interval; (3) the interval between acupuncture treatments; (4) the second acupuncture treatment interval; and (5) the 189 days after the last acupuncture treatment. Mean AF levels

during each interval and differences vs the pretreatment interval were estimated as least square means. Ninety-five percent confidence intervals and two tailed P values were adjusted for multiple comparisons.^{6,7} All analyses were performed using SAS (v 9.1.3, SAS Institute Inc, Cary, NC).

The analysis of the pacemaker data occurred several months after the patient's last visit and therefore, the data were never discussed with the patient prior to the conclusion of the treatments.

Results

Acupuncture was well tolerated by the patient with no adverse effects. Weekly AT/AF (atrial tachycardia/atrial fibrillation) episodes and weekly percent time in AT/AF were quite variable during the first series of treatments, whereas AF weekly episodes and percent time in AF during the second series of treatments were less variable, more consistent, and at the lower end of values (Fig 1).

Least square estimates of AT/AF event rate and percentage time in AT/AF by treatment phase and differences from pretreatment estimates are

presented in Table 1. The pretreatment estimate of AT/AF event rate is 71.4 events/week over the 180 days prior to the first acupuncture treatment (on 10 February 2005). The estimated event rate during the second treatment phase (16.5 events/week) was significantly lower (95% CI -6.5 to -103.3 events/week, $P=0.02$). The event rate estimates during the first treatment, inter-acupuncture, and post-acupuncture phases (50.1, 54.8, and 43.8 events/week, respectively) were not statistically significantly lower than during pretreatment.

The pretreatment estimate of the percentage time in AT/AF was 30.6%. The estimated percentage time in AT/AF was higher during the first treatment series and the inter-acupuncture phases (38% and 39%, respectively) and lower during the second treatment series and post-acupuncture phases (18% and 24%, respectively). The difference from the pretreatment interval approached statistical significance during the second series and post-acupuncture phases (95% CI .9 to -26, $P=0.08$ and 95% CI .6 to -13.8, $P=0.09$, respectively).

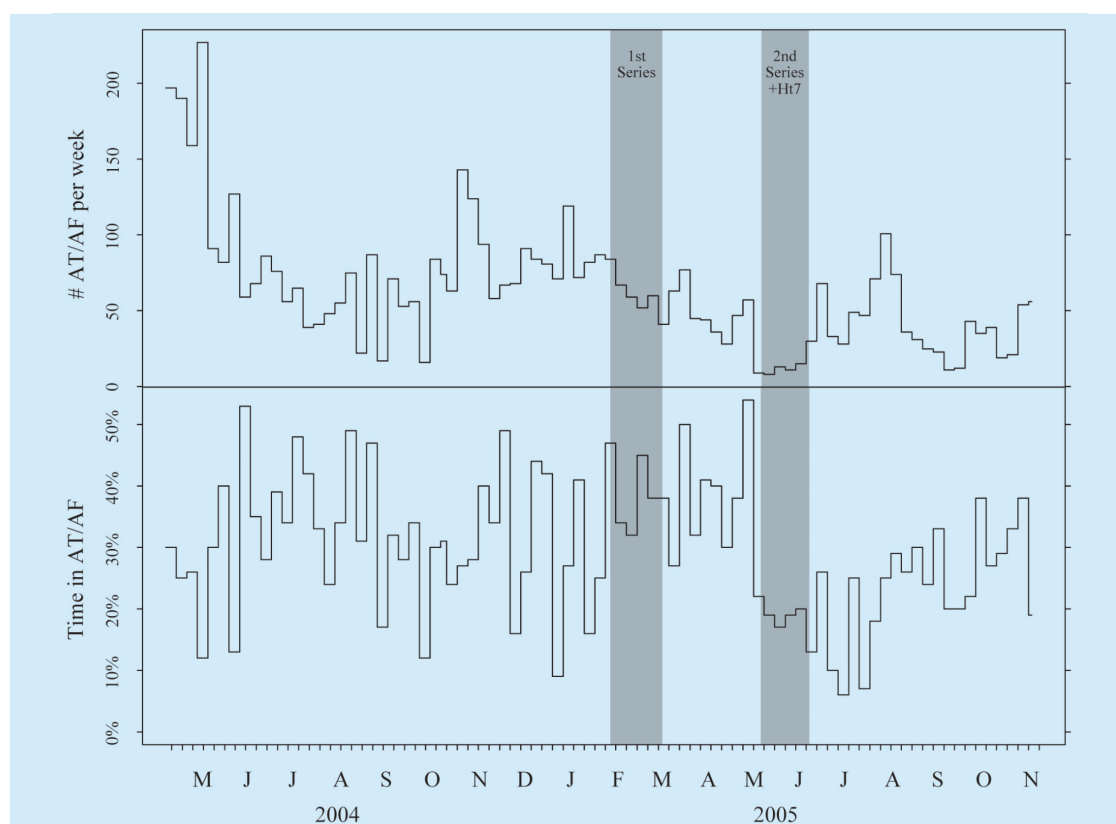


Figure 1 Weekly time series of atrial tachycardia/atrial fibrillation (AT/AF) event rate and percentage of time in AT/AF. Periods of acupuncture treatment are shaded. Tick marks are placed every Sunday.

Table 1 Atrial tachycardia/atrial fibrillation event rate

Measure	Phase	Est	Difference from pretreatment		
			Est	95% CI	P
AT/AF episodes per week	Pretreatment	71.4			
	1st Series	50.1	-21.2	26.3 to -68.8	0.78
	Inter-acupuncture	54.8	-16.6	24.4 to -57.6	0.84
	2nd Series (+HT7)	16.5	-54.9	-6.5 to -103.3	0.02
% time in AT/AF	Post-acupuncture	43.8	-27.5	4.7 to -59.8	0.14
	Pretreatment	30.6			
	1st Series	38.0	7.4	20.9 to -6.0	0.58
	Inter-acupuncture	39.0	8.4	18.3 to -1.6	0.15
	2nd Series (+HT7)	18.0	-12.6	0.9 to -26.0	0.08
	Post-acupuncture	24.0	-6.6	0.6 to -13.8	0.09

Least square estimates (Est) of AT/AF event rate and percentage of time in AT/AF by treatment phase and differences from pretreatment estimates, together with 95% confidence intervals and P values corrected for multiple comparisons.

Table 2 Neuralgia pain scores

	Continuous pain	Frequency and duration of severe pain (10/10)
Prior to acupuncture treatment	6/10	>1 hour, several times day
Post 1st treatment series	2-3/10	<10 minutes, once per 2-3 days
Post 2nd treatment series	0-2/10	<5 minutes, once per 3-4 days
5 months post-treatment	Gradual increase to 4/10	<20 minutes, once per 2 days

Scores based on a subjective 10 point Likert Scale

Prior to acupuncture, the patient's pain level was at a level of 6 with several daily episodes of severe pain (level 10) lasting longer than one hour. Following the first treatment series, the pain level was 2-3 with severe episodes occurring once every two to three days lasting for less than 10 minutes. Following the second treatment series, the pain level was 0-2 with severe episodes occurring once every three to four days lasting less than five minutes. Over five months following the last treatment series, the pain level gradually increased to 4 with severe episodes occurring once every two days lasting less than 20 minutes. Pain levels are presented in Table 2.

At the conclusion of her acupuncture treatments, the patient expressed gratitude for the improvement in her quality of life, significant pain relief, reduction in anxiety and awareness of the fluttering sensation in her chest, and increased energy.

Discussion

Atrial fibrillation

This case study suggests that acupuncture including point HT7, when combined with standard care, was associated with a reduction of both the weekly number of AF episodes and the percentage time in AF during the second series of acupuncture treatments.

Prior literature evaluating the effects of acupuncture on cardiac arrhythmias is scarce. Some animal studies using PC6 as the main point and designed to determine possible mechanisms for acupuncture effects on cardiac functioning suggest that acupuncture may reduce arrhythmias by alleviating sympathetic over stimulation of the heart.⁸⁻¹³ Several TCM acupuncture texts mention points that address palpitations and pattern differentiations with corresponding point prescriptions for palpitations; however, atrial fibrillation is not specifically mentioned in these texts.^{2,4}

Human data are limited to two small studies of AF reported in Chinese language journals. One study randomised 62 patients to either acupuncture, medication (quinidine, verapamil procainamide, amiodarone, and antazoline), or electrical cardioversion and compared their efficacy for converting AF to a normal rhythm. The cardioversion rates were acupuncture: 75%; medication: 80%; and electrical cardioversion: 76%.¹⁴ A second uncontrolled study evaluated 31 patients with a 6 month to 11 year history of AF who underwent 60 acupuncture treatments. At a one year follow up, 20 patients (67.7%) had no evidence of AF on EKG (electrocardiogram).¹⁵

The points used in the present case that may be attributable to observed changes in the patient's cardiac arrhythmia according to TCM theory are PC6, BL15, and HT7.¹⁶ The points PC6 and BL15 were included in the first series. HT7 was added in the second series. However, because of the data resolution (weekly events) and the timing of the initiation of the second acupuncture series, it is unclear whether or not the reduced AF rate preceded the initiation of the second series. Therefore, whether the reduced AF rate was associated with cumulative effects of the first and second series of treatments, or primarily the second series (with HT7), or either, is unknown. It is interesting to note that the least square estimates of both AF and percent time in AF were lowest during the second series, when they achieved statistical significance, suggesting that HT7 might be an important acupuncture treatment point for reducing AF episodes and duration and should be further studied.

This was a single, uncontrolled case study and therefore the relationship between the acupuncture treatments and the patient's clinical outcomes is uncertain, though her medical therapy remained unchanged during the observation period. Other possible explanations for the reduction of AF episodes include a link between the PHN-related pain reduction and/or anxiety and frequency of AF episodes, placebo effect, or chance.¹⁷ It is interesting to note that there were two 'spikes' of increased AF episodes following the second series of treatments, which coincided with times of very high stress and anxiety in the patient's personal life. We believe the relationship between acupuncture and AF merits further study in a controlled manner, including assessment of stress and anxiety levels, and objective measures of cardiac sympathetic tone.

Post-herpetic neuralgia

Numerous case studies and patient series have evaluated the benefits of acupuncture for PHN. In one study, among 23 patients with PHN (duration ranging from three weeks to three months) treated with 60 sessions of acupuncture over 75 days, including electrical stimulation, 18 (78%) were pain free and 5 (22%) were significantly improved with occasional attacks of milder pain.^{18,19} These results are consistent with observations in the present case. However, a randomised study of auricular and body

acupuncture observed no difference in pain relief compared to a sham TENS control.²⁰

Our patient's self evaluation of pain levels suggest that acupuncture treatments, when combined with usual care, may have provided some pain relief, though the causality cannot be determined in this open observational study, and other factors may be involved, such as placebo. It is interesting to note that both the severe episodes and the general pain level markedly declined during the acupuncture series but gradually increased over time to below pre-acupuncture levels, but less so for the severe episodes. Further controlled studies of acupuncture for PHN are warranted.

Conclusion

Acupuncture, combined with standard medical care, was associated with a reduction of frequency and duration of atrial fibrillation as well as post-herpetic neuralgia in a 72 year old woman. Controlled studies evaluating the efficacy and safety of acupuncture for these two conditions should be performed.

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Conflict of interest

No conflict declared.

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