

Parkinson's disease: Role of Acupuncture Study a Randomized Study of Fatigue Behavior

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Abstract

Fatigue is a common and disabling problem in patients with Parkinson's disease (PD), and there is currently no satisfactory treatment. As acupuncture has been reported to be effective in fatigue related to other conditions, we sought to evaluate its efficacy in PD.

Keywords: acupuncture, fatigue, Parkinson's disease, randomized controlled trial.

Introduction

Fatigue is one of the commonest nonmotor symptoms in Parkinson's disease (PD) and has negative impact on quality of life (Barone et al., 2009; Friedman, Abrantes, & Sweet, 2011; Skorvanek et al., 2013). In one of the first studies on fatigue in PD, 15–33% of patients rated it as their most disabling symptom, and more than half rated fatigue among their three worst symptoms (Havlikova et al., 2008). There is currently no satisfactory treatment of PD-related fatigue (Franssen, Winward, Collett, Wade, & Dawes, 2014).

Acupuncture has been shown to be effective in the treatment of fatigue related to other conditions, in particular, cancer-related fatigue (Molassiotis et al., 2012; Sood, Barton, Bauer, & Loprinzi, 2007). Apart from a recent study (Kluger et al., 2016) its role in PD-related fatigue has not been explored. The aim of this randomized, controlled pilot study was to evaluate the efficacy of a 5-week course of acupuncture in the treatment of fatigue in PD.

Patients and methods

Study design

This was a randomized, patient and assessor-blinded, controlled pilot study assessing the efficacy of acupuncture in patients with PD-related fatigue.

Subjects and setting

Participants attending the Parkinson's disease Clinic of National Neuroscience Institute- Tan Tock Seng Hospital, Singapore who met the following inclusion and exclusion criteria were recruited. The inclusion criteria were (1) diagnosis of PD based on criteria developed by Gelb, Oliver, & Gilman (1999) which is adopted by the National Institute of Neurological Disorders and Stroke, US National Institute of Health, (2) age 21–85 years old, (3) presence of moderately severe fatigue as defined by a score of ≥ 10 on the General Fatigue domain of the Multidimensional Fatigue Inventory (Smets, Grasen, Bonke, & De Haes, 1995), and (4) no acupuncture treatment in the past 6 months.

The exclusion criteria were (1) significant cognitive, language or psychiatric illnesses which prevents the subject from understanding instructions and participating in the study, (2) needle phobia, (3) comorbidity with a bleeding disorder, (4) known anemia with hemoglobin level < 10 g/dl, (5) known congestive cardiac failure and/or end-stage renal disease, (6) female subjects of childbearing age, and (7) presence of symptomatic postural hypotension.

Screening and Randomization

Opportunistic screening of patients attending the Parkinson's Disease Clinic of National Neuroscience Institute- Tan Tock Seng Hospital, Singapore was conducted.

After informed consent, eligible patients were randomized in a 1:1 fashion without stratification to real or sham acupuncture using permuted blocks. Allocation to treatment group was managed by an interactive web response system using computer-generated lists organized by a statistician who is independent of the study. Only the two treating acupuncturists had access to the interactive web response system. All other study team members were blind to group assignment.

Intervention

Treatment consisted of twice-weekly sessions at least 3 days apart for 5 weeks, giving a total of 10 sessions of acupuncture. Acupuncture was performed with the patient supine on a acupuncture table. The retractable noninvasive sham and invasive acupuncture needles developed by Jongbae Park (Park Sham Device, PSD) were used in this study (Park, White, Stevenson, Ernest, & James, 2002). Both real and sham needles have a fine needle body and copy handle and look exactly the same. However, the retractable needle has a retractable shaft and blunt tip. When pressed onto the skin, it telescopes into the handle and the blunt tip stays on the skin instead of penetrating it. The plastic tube with adhesive foot-plate is placed on the skin to hold it in place. The real needle, on the other hand, has a normal sharp tip which allows it to pierce the skin. Both needles are 70 mm long. The Park Sham needle has been well validated as an inactive and credible placebo control in clinical acupuncture trials.

Primary outcome measure

The primary outcome measure was the change in General Fatigue domain score of the Multidimensional Fatigue Inventory (MFI) from baseline at 5 weeks. The MFI is a 20-item self-reporting tool that measures five dimensions of fatigue: General Fatigue, Physical Fatigue, Reduced Activity, Reduced Motivation, and Mental Fatigue. Each subscale contains four items, which are scored on a five-point Likert scale.

Statistical analysis

In a previous study of prevalence of fatigue in PD using the MFI, the mean General Fatigue score was 15.2 with a standard deviation of 3.0 (Skorvanek et al., 2013). Assuming a 20% reduction in MFI score in the acupuncture group compared to control, a two-sided sample comparison of means requires 16 participants per group with significance level at 0.05 and power of 0.8. Hence, a total of 32 participants need to be recruited. Assuming a drop-out rate of 20%, the number of participants needed will be 40. The effect size of 20% was chosen on the premise that anything less than this is not likely to be clinically significant.

Results

Group demographics and characteristics.

	Overall mean \pm SD or n (%)	Acupuncture mean \pm SD or n (%)	Sham mean \pm SD or n (%)	<i>p</i> Value
Age (years)	64.6 \pm 8.4	66.4 \pm 6.5	62.9 \pm 9.7	.19
Female	27 (67.5)	14 (70.0)	13 (65.0)	.73
Duration of PD (months)	68.8 \pm 45.5	87.2 \pm 53.2	50.1 \pm 26.4	.008
Levodopa equivalent dosage	615.2 \pm 347.9	637.8 \pm 394.3	592.6 \pm 303.1	.68
MFI – Total	59.3 \pm 12.8	61.6 \pm 15.1	56.6 \pm 9.2	.23
MFI – General Fatigue	13.4 \pm 2.8	13.4 \pm 2.9	14.0 \pm 2.7	.47
UPDRS Motor	25.4 \pm 12.4	27.1 \pm 13.7	23.8 \pm 10.9	0.39
PDQ- 39	31.2 \pm 22.6	38.4 \pm 25.1	23.7 \pm 17.5	0.042
ESS	7.1 \pm 4.0	7.5 \pm 3.8	6.7 \pm 4.4	0.59
GDS	3.6 \pm 2.9	4.0 \pm 3.3	3.3 \pm 2.5	0.44

p - values that are in bold shows statistical significance.

Assessment of blinding

Patients were queried at Week 5 point regarding what group they thought they were in, and there were no between- group differences in patients' perceptions of group assignment consistent with effective blinding (chi- square, *p* = .32).

Discussion

The results of this pilot study show that a 5- week course of acupuncture treatment, real or sham, was effective in improving fatigue in a cohort of patients with PD. Furthermore, this improvement was maintained up to 4 weeks after completion of treatment. Apart from improved UPDRS Motor scores, real acupuncture group had no significant impact on scores of quality of life, mood, and excessive daytime sleepiness compared with sham acupuncture. In fact, there was a trend toward greater reduction in fatigue scores in the sham group (*p* = .09). To evaluate whether the improvement in fatigue is clinically meaningful, we looked at the minimal important difference of the MFI. The minimal important difference is defined as “the smallest difference in score in the domain of interest which patients perceive as beneficial and which would mandate, in the absence of troublesome side effects and excessive cost, a change in the patient's management” and is particularly useful in patient- reported outcome measures (Jaeschke, Singer, & Guyatt, 1989). Unfortunately, no data exist on the minimal important difference of the MFI in PD. Hence, we can only extrapolate from data involving patients with rheumatological conditions, and in this group of patients, the minimal important difference for the MFI- Total is 11.5 (Nordin, Taft, Lundgren- Nilsson, & Dencker, 2016). Using this result, 40% of real acupuncture and 60% of sham acupuncture patients in our study had clinically meaningful improvements in fatigue.

Conclusion

Acupuncture (real and sham) is safe and effective in reducing fatigue in a cohort of patients with PD. Given the current absence of satisfactory treatment of fatigue, there is a potential role for the use of acupuncture in the treatment of PD- related fatigue, even if its mechanism of action is largely placebo.

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