Introduction

1. Why study Heart Rate Variability (HRV) with Acupuncture? Stress has negative impacts on the immune system, aging, mood, inflammation and pain. Acupuncture has been shown to affect all of the above, though the mechanisms remain unclear. Heart rate variability (HRV) is a noninvasive monitor of autonomic balance, a measure of physiological stress. Though HRV is problematic and exacting, its ease of application in the clinic gives it potential as a biomarker for treatment. HRV has been correlated with other more accepted and precise physiological markers of stress and inflammation relevant to acupuncture treatment e.g. cortisol, norepinephrine, epinephrine, Il-6, IFN- γ , fMRI, and telemetric length.

2. Why this study?

Though there is evidence that acupuncture decreases the stress response and increases HRV, in both human and animal subjects in the short term, (during and after treatment) data looking at longer term effects (weeks to months) is scant. Data will be presented here, though uncontrolled, to explore whether patients' HRV profiles improve over time with consistent acupuncture treatment.

Materials and Methods

8 acupuncture patients receiving treatment for hypertension are presented here. Their treatment courses are not uniform. Some come for weeks some years. All received Traditional Chinese Medicine body acupuncture according to their presenting pattern and diagnosis in addition to the Longhurst protocol for hypertension. Outcomes were patients' blood pressure measurements. Heart rate was measured during treatment after needle placement, then data analyzed using VivoSense software. LFR/HFR (Low frequency/High frequency) trends were chosen for report though other parameters (Sample Entropy, pNN50, HF, HF norm, Poincaré plots, DFα1, and TP) were also measured.



Ancient Medicine Made Modern







DaHa 55 y.o. Male Patient



ErHi 33 y.o. Female Patient



EdHi 33 y.o. Female Patient

Does Acupuncture Reduce Stress Over Time? A Clinical Heart Rate Variability Study in Hypertensive Patients

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Decreasing Values in Low Frequency/High Frequency (LF/HF) Ratios Indicate a Decrease in Stress Response

Patients Monitored from Beginning of Treatment Series

DaHa 55 y.o. Male Patient



SaKa 70 y.o. Male Patient



SaKa 70 y.o. Male Patient



JeSe 48 y.o. Female Patient



JeS 48 y.o. Female Patient

Patients Monitored After Treatment Series Started



PaDy 65 y.o. Male Patient



Pa.Dy 65 y.o. Male Patient



Kalle 70 y.o. Female Patient



KaHe 70 y.o. Female Patient



ChRi 36 y.o. Female Patient



ChRi 36 y.o. Female Patient



ViSa 44 y.o. Female Patient



ViSa 44 y.o. Female Patient



Discussion

Napadow and his group provide evidence that the autonomic nervous system responds within seconds to verum acupuncture and Litscher and Huang have documented HRV changes during and after acupuncture treatment. Though clinical reports are of limited value due to their unscientific nature, clinical practice is uniquely situated to provide a glimpse into longer term outcomes over months to years rarely available in academic settings. This presentation compiled data from the author's ongoing exploration of HRV during acupuncture treatment. To determine overall HRV response over time, the entire acupuncture session was chosen. Though crude, there may be something to be learned from these data sets. The literature is not definitive on which parameter (nonlinear, frequency, time) is the most representative and least affected by artifact. Low Frequency/High Frequency Fast Fourier Transform frequency ratios were used for this study after comparing multiple parameters. LF/HF was least affected by artifact and relative differences in individual treatments and thus was used for this study. There were only 4 patients represented whose HRV was measured from the start of their treatments. Their data is highlighted in the data section. The others are included for interest.

Correlation of long term HRV with HRV response during treatment is of paramount interest to the author. Also correlation with more definitive measures of health such as inflammatory biomarkers (e.g. CRP, Il-6) stress biomarkers (cortisol, Epinephrine), aging (telomerase) and brain studies will be key to understanding acupuncture's effectiveness going forward.

Conclusions

This report is part of an ongoing exploration using HRV as an additional biomarker for acupuncture effectiveness. This small case series suggest that HRV might increase over weeks to months with acupuncture treatment, but no definitive conclusions can be drawn. More detail on individual patients and their outcomes is provided in the printed supplemental materials.

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for a compendium of Acupuncture and HRV references please go to http://www.ksparrowmd.com/category/kristen-sparrow-md-blog/ heart_rate_variability/

