CAPTURING THE HEALING SHIFT



USING HRV TO IDENTIFY EFFECTIVE ACUPUNCTURE TREATMENT

Development of a Heart Rate Variability Protocol for Use in the Acupuncture Clinic

HRV MAY HELP TO

• Show that acupuncture can reduce stress over time in addition to clinical symptom improvement

- Identify clinical responders versus clinical nonresponders
- Optimize needling and treatment strategies for clinical results

WHY THIS PROJECT? WHY DEVELOP A BIOMARKER?

Better results! Faster, more reproducible

- Good for patients
- Good for business

• Good for credibility of Acupuncture in general

• Good for Acupuncture Research community

WHY THIS PROJECT? WHY DEVELOP A BIOMARKER?

•Vagal Enhancement is big business
•HRV measures vagal activity, what acupuncture related strategies improve vagal activity?

HRV IS A TOOL THAT MEASURES STEADY STATE STRESS AND DYNAMIC STRESS RESPONSE

• Snapshot of health or resilience

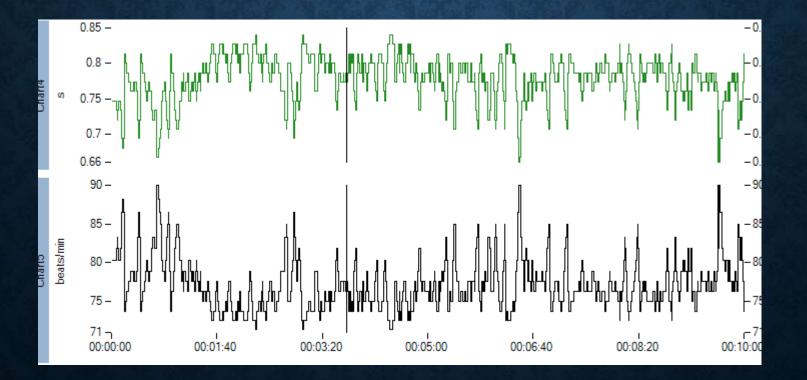
•Measure of dynamic response to treatment

CAPTURING THE HEALING SHIFT



HEART RATE VARIABILITY MONITORING IS A NONINVASIVE MEASURE OF AUTONOMIC BALANCE (STRESS)

• Noninvasive Method of **measuring autonomic balance, or stress levels,** using computer analysis of the variability of heart rate with breathing



POOR HRV= POOR HEALTH

HRV decreases with

- Old Age
- Injury
- Illness
- Stress

STRESS: BAD FOR HEALTH, MOOD, LIFE

- Immunology (allergies, autoimmune)
- Mood (Anxiety, depression, panic attacks)
- Pain Thresholds
- Longevity

If we do nothing but decrease stress (increase parasympathetic activity) we've done a lot

HRV= SNAPSHOT OF STRESS LEVELS

HRV (Stress Levels) and High Blood Pressure

HRV (Stress Levels) and Coronary Disease Measures

HERCAL ACCREMENTER Volume 26, Massher 5, 2014 C Mury Am Lathert, Inc. DOI: 10.1207/jami.2014.0190

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

Kristen Sparrow, MD, and Brenda Goliane, MD2

ABSTRACT

Background: Heartrate variability (HRV), a noninvaries nationenic measure, has been applied to acapteneture interventions in controllarl academic setting comparing priors used, types of utmulation, or the HRV parameters measured. There is evidence that acquinctare documents the stress response in both human and annual subjects, and can increase HRV in the short term contracts to hours).

Objectives: The goal of this study was to explore an array of HRV parameters during acaptucture sessions and more the course of treatment (works to months) in a senier of patients being smalled for hypertension.

Materials and Methods: This was a retringentive, uncontrolled case study of patients presenting to a private scapanetize clinic. Patient received manual body acapanetize presented by the trees of "Individual Chinese Medicine (CIM) and by published protocols for hypertension treatment. Heat rate was monitored during and after oneille placement. The tracings serve then analyzed with the Viewense HRV analysis system. The train outcome treasures were were patients' blood pressure measurement and low-frequency-to-bigh-frequency (LPRP) rule of HRV.

Results: Patients tended to have an increase in their HRV during totatment, after ocedling, and, in some instances, an increase in HRV over weeks to months.

Conclusions: Some patients' HRV increased over weeks to months during the count of acquinctum traitment for hypertensions an evidenceal by a deemase in their LF/HF ratio. This would indicate a relative discrease in their physiologic atrus.

Key Words: Approchegani Beat Bast Variability, Augmentant and Hypertonics, Acquincian Physiology



International Journal of Cardiology

International Journal of Cardiology size (2014) rosc-see

Contents lists available at ScienceDirect.



A randomized controlled trial of acupuncture in stable ischemic heart disease patients A. A.A.

Puja K. Mehta ^a, Donna M. Polk ^b, Xiao Zhang ^c, Ning Li ^d, Jeannette Painovich ^a, Kamlesh Kothawade ^a, Joan Kirschner ^a, Yi Qiao ^a, Xiuling Ma ^a, Yii-Der Ida Chen ^c, Anna Brantman ^a, Chrisandra Shufelt ^a, Margo Minissian ^a, C. Noel Bairey Merz ^{4,8}

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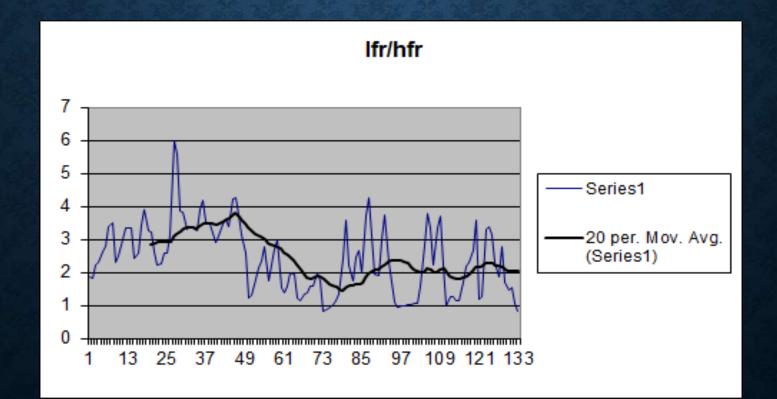
ABSTRACT

Aritich fustery: Reserved 15 February 2014 Reserved in revised litery 10 May 2014 Ascepted 5 July 2014 Available unline xxxx Background: Heart rate variability (HW) is reduced in stable lochemic heart disease (SHD) patients and is asso clated with studden cardiac death (SCD). We evaluated the impact of traditional acupanence (TA) on cardiac autonomic function measured by HW in SHD patients.

Methods: We conducted a randomized controlled study of TA, sharn acupuncture (SA), and waiting control (WC) in 131 SIHD subjects. The TA group received needle insertion at acupuncture sites, the SA group received a sharn

HRV PROFILE/STRESS REDUCTION MAY CORRELATE WITH SUCCESSFUL ACUPUNCTURE TREATMENT

Responders show a decrease in their stress response during acupuncture treatment



PATIENTS WHO HAVE CLINICAL IMPROVEMENT WITH ACUPUNCTURE ALSO HAVE IMPROVEMENT IN HRV

MEDICAL ACUPUNCTURE Volume 19, Number 1, 2007 © Mary Ann Liebert, Inc. DOI: 10.1089/acu.2006.0000

Analysis of Heart Rate Variability in Acupuncture Practice: Can It Improve Outcomes?

Kristen Sparrow, MD

ABSTRACT

Background: Acupuncture may achieve results partially through altering vagal tone. Heart rate variability (HRV) monitoring is a noninvasive method of observing sympathovagal tone.

Objectives: To explore HRV analysis methods applicable to the acupuncture clinic setting, and to compare intratreatment HRV response in patients who have responded to their acupuncture series with patients who did not respond.

Design, Setting, and Patients: Retrospective, uncontrolled observational study of 27 patients presenting to a private acupuncture clinic.

Intervention: All patients received body acupuncture prescribed by the tenets of Traditional Chinese Medicine (TCM), according to their presenting pattern and diagnosis. Data were analyzed after their treatment course was completed.

Main Outcome Measure: Patients' assessment of progress and functionality, as a function of their LFR/HFR (low frequency to high frequency ratio) HRV intratreatment trend.

Results: Patients who responded to their acupuncture series tended to exhibit a decrease in LFR/HFR during the acupuncture treatment. Non-responders tended to show no change or an increase in their LFR/HFR. **Conclusions:** In this study, the correlation between vagal enhancement (decrease in LFR/HFR) during

acupuncture treatment and positive response to acupuncture was supported.

http://www.ksparrowmd.com/wp-content/uploads/sparrow-research1.pdf

MIGRAINE PATIENTS WHO IMPROVE WITH ACUPUNCTURE ALSO HAVE IMPROVEMENT OF THEIR HRV DURING TREATMENT

ORIGINAL ARTICLE

• (Clin J Pain 2008;24:106–115)

Acupuncture in Migraine Investigation of Autonomic Effects

Marcus Bäcker, MD,* Paul Grossmun, PhD,†‡ Jens Schneider,* Andreas Michalsen, MD,* Nicola Knoblauch, MD,* Linda Tan, MD,* Corinna Niggemeyer, MD,* Klaus Linde, MD,§ Dieter Melchart, MD,§ and Gustav J. Dobos, MD*

Objective: A dysregulation of the autonomic nervous system is discussed as a pathogenetic factor in migraine. As acupuncture has been shown to exhibit considerable autonomic effects, we tested whether the clinical effects of acupuncture in migraine prophylaxis are molitated by changes of the autonomic regulation.

Methode: We aimultaneously monitored changes of heart-rate variability (HRV) as an index of cardine automonic control and clinical improvement during an acapancture treatment in 30 migraineurs. HRV was derived from spectral analysis of the electrocardiagram, which was performed before, during, and durb rth first and the last session of a series of 12 acoputcture sessions. Migraineurs were randomly allocated to 2 groups receiving either verum acupancture (VA) or shum acupancture (SA) treatment.

Boadles Acrows the combined VA and SA groups, the clinical responders (with at least 50% reduction of migraine attacks) exhibited a decrease of the low-frequency (LF) power of HBV in the course of the treatment, which was not be observed in patients without clinical benefit. VA cumpared with SA induced a stronger decrease of high-frequency power. The mode of acaptancture, however, did not have an impact on the LF component of HRV or the clinical outcome. on the high-frequency component of HRV, which seem, however, not to be relevant for the clinical outcome in migraine.

Key Words: acupuncture, migraine, mechanism of action, heart rate variability, sympathetic nerve activity, autonomic nervous system

(Clin J. Pain 2008;24:166-115)

A cupuncture is increasingly used as adjunctive treatservent in primury headache syndromes¹ and there is growing evidence from clinical trails, that it might be beneficial in the treatment of migraine,^{2–5} with an effect size comparable to pharmacologic treatment.² As one major aspect in the pathophysiology of migraine, a dyaregulation of the autonomic nervous system (ANS) has been postaluted.^{4–4} As accupancture has been shown to induce distinct autonomic effects,⁸ the clinical effects in migraine might be mediated by a modulation of the ANS.

Although in the last 3 decades the physiologic mechanisms of acupaneture have been investigated extensively, its mechanisms of action still remains elusive. Neurophysiologic data from animals show that on a spinal level acumuneture exhibits an influence on

ACUPUNCTURE AND HRV HAS BEEN STUDIED AND WE KNOW MORE ABOUT RESPONSE WITH:

- Animals, healthy volunteers, patients with various conditions
- Acupuncture points
- EEG
- FMRI
- Skin resistance
- GI Motility

HRV MONITORING PROTOCOL

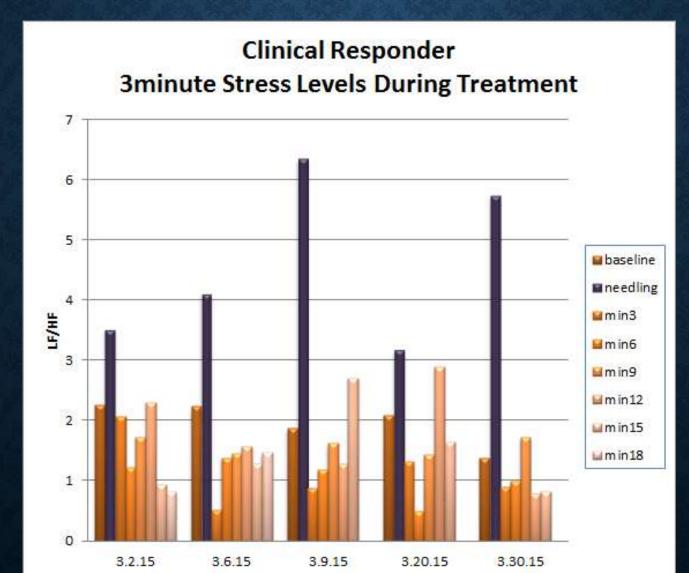
- Retrospective
- No Controls
- Nonin pulse oximeter
- Use Vivosense software with artifact correction
- Segments Presented here: Baseline, Needling, 3 minute windows on table





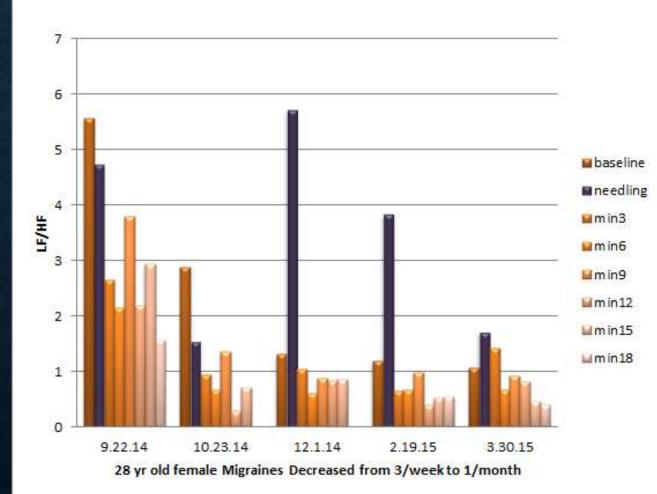
Good, Bad, Ugly

MIGRAINE PATIENTS: DATA GOOD!

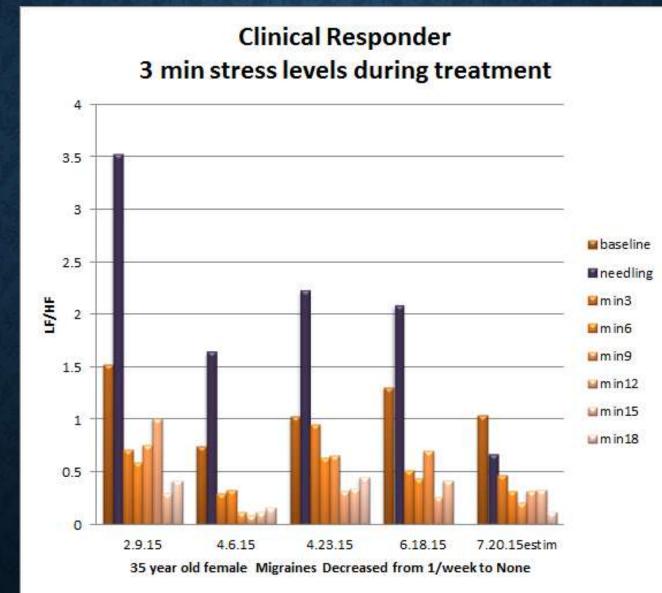


MIGRAINE PATIENTS: DATA GOOD!

Clinical Responder 3 min stress levels during treatment

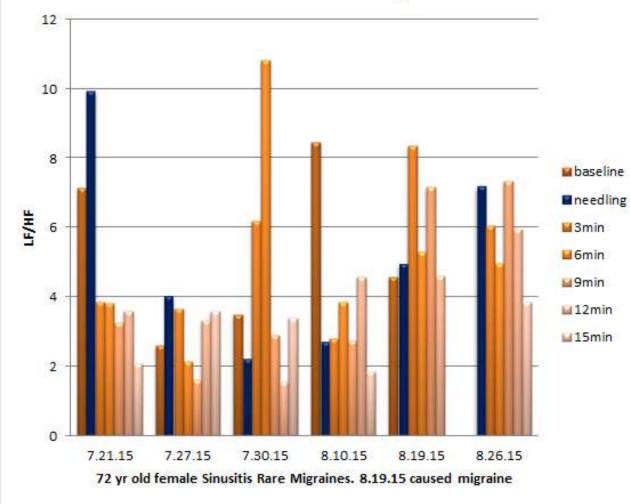


MIGRAINE PATIENTS: DATA GOOD!

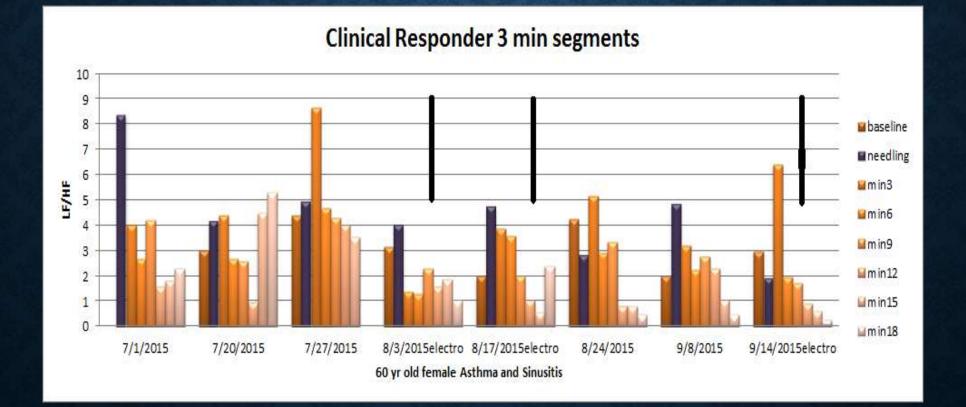


MIGRAINE PATIENTS: DATA BAD!

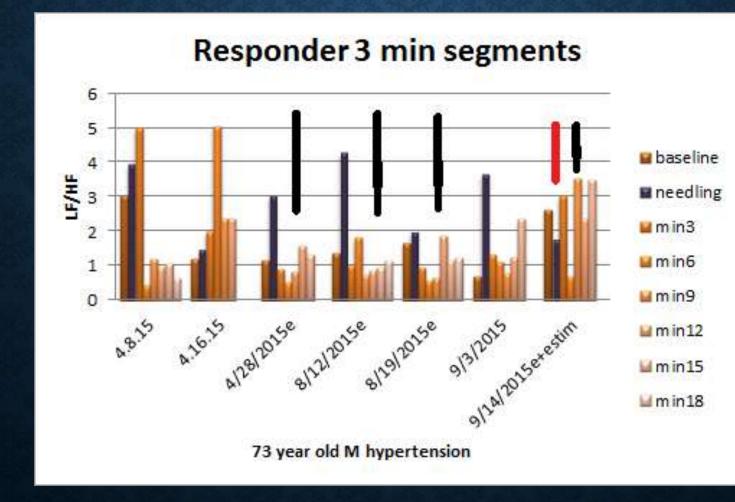
Clinical Non-Responder 3 min stress levels during treatment



DOES ELECTRICAL STIMULATION AT 2HZ MAKE A DIFFERENCE IN HRV PROFILE?

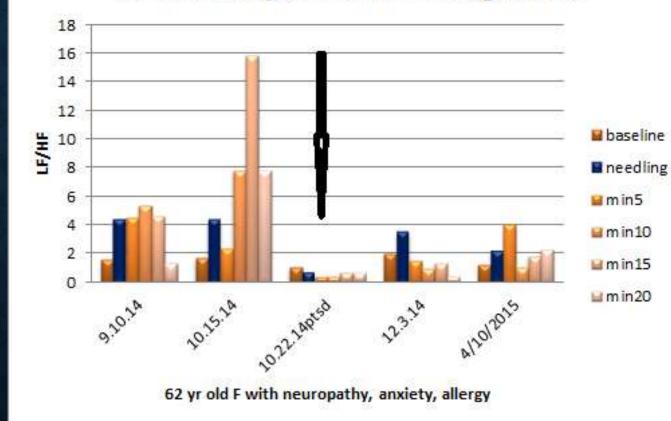


DOES ELECTRICAL STIMULATION AT 2HZ MAKE A DIFFERENCE IN HRV PROFILE?

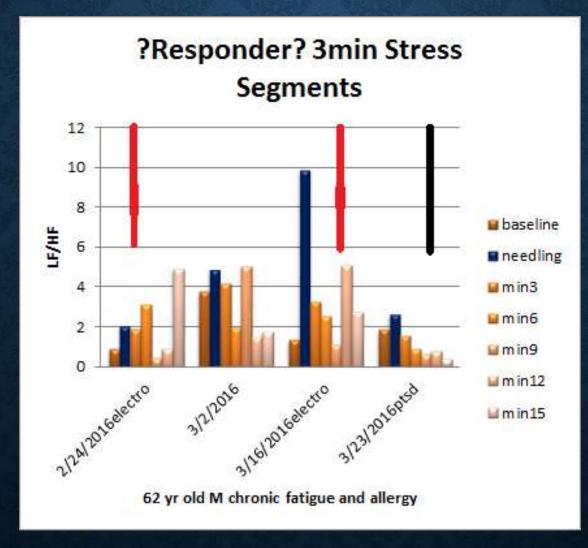


SCALP ACUPUNCTURE: PTSD PROTOCOL

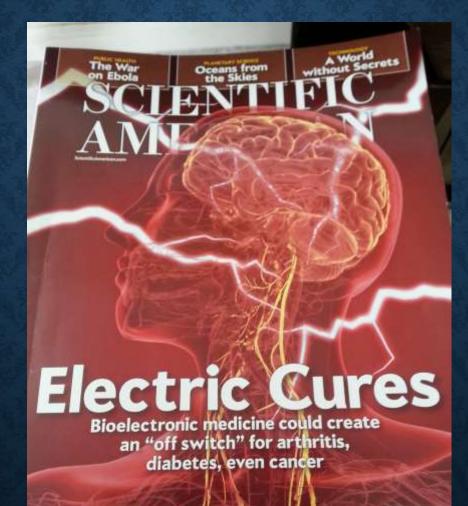
Clinical Responder 5 min Segments



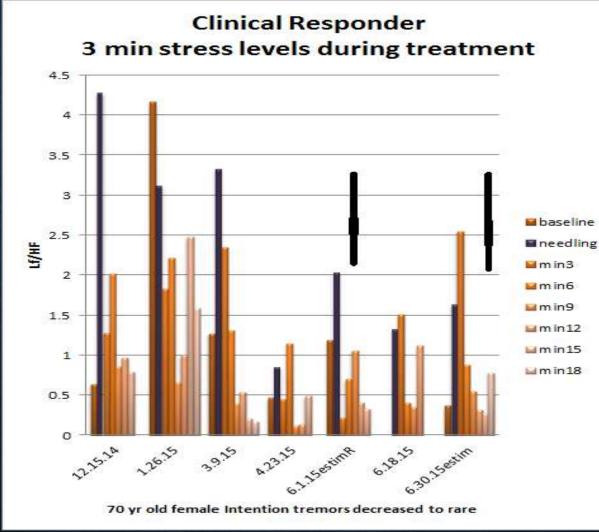
SCALP ACUPUNCTURE: PTSD PROTOCOL



ELECTROCEUTICALS: VAGAL STIMULATION

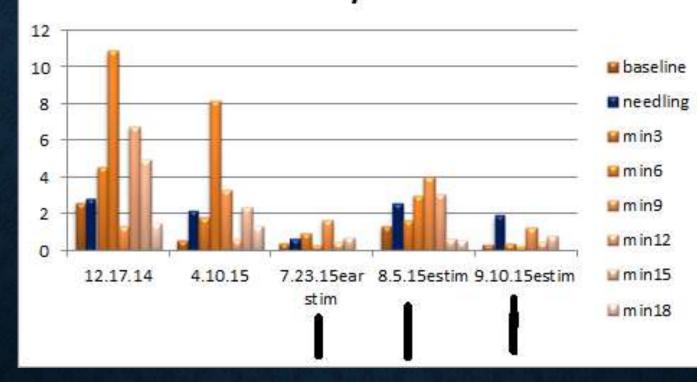


DATA USING TRANSCUTANEOUS EAR VAGAL NERVE STIMULATION ?GOOD?

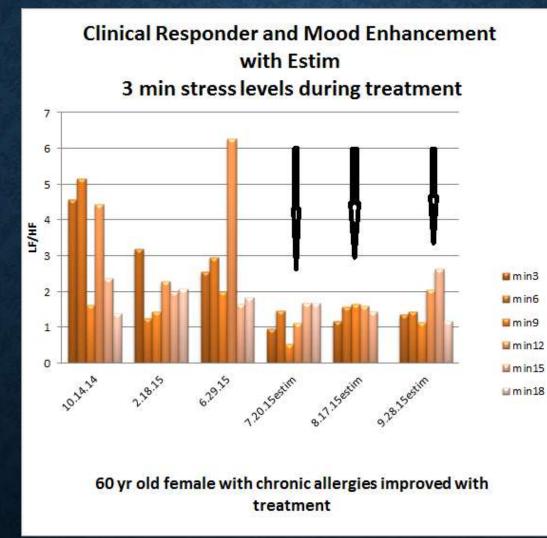


DATA USING TRANSCUTANEOUS EAR VAGAL NERVE STIMULATION: GOOD!

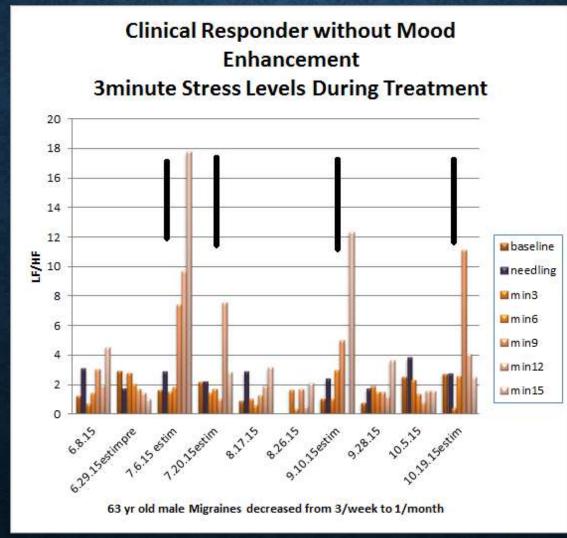
3min Stress Levels During Treatment LF/HF



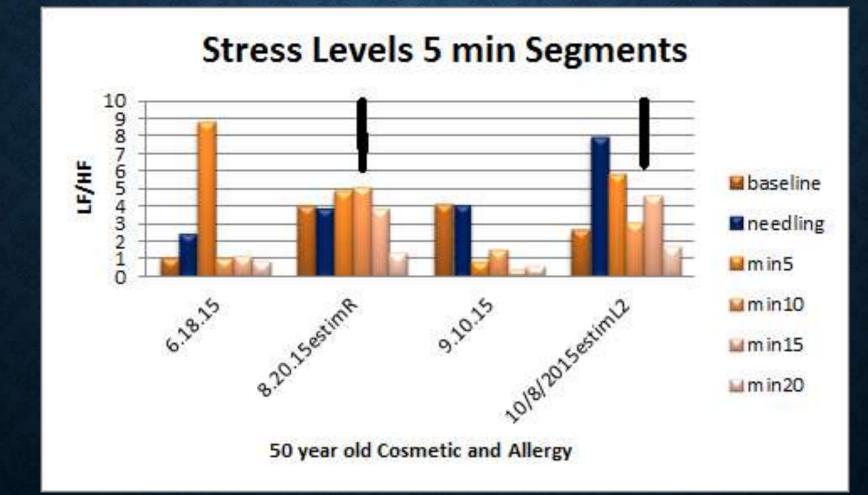
DATA USING TRANSCUTANEOUS EAR VAGAL NERVE STIMULATION: GOOD!



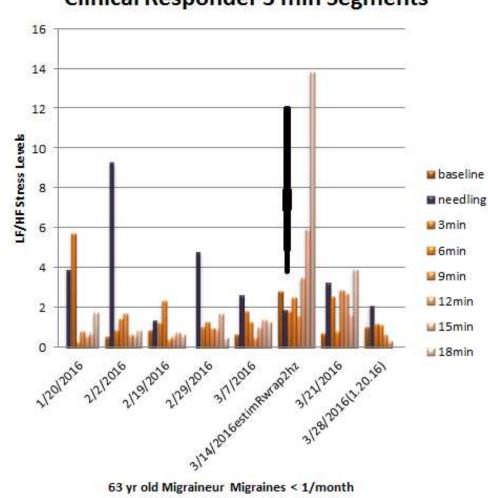
DATA USING TRANSCUTANEOUS EAR VAGAL NERVE STIMULATION: BAD!



DATA USING TRANSCUTANEOUS EAR VAGAL NERVE STIMULATION: BAD!

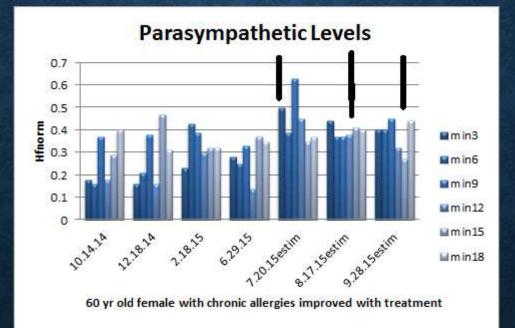


DATA USING TRANSCUTANEOUS EAR VAGAL NERVE STIMULATION: BAD!



Clinical Responder 3 min Segments

EAR VAGAL STIMULATION: VARYING RESULTS



CONCLUSIONS

- Protocol may or may not help in identifying effective treatment
- In some patients, scalp acupuncture may decrease stress response
- Electrical stimulation? Doesn't increase stress response after needling.
- Ear stim, on the other hand, may increase stress response in conjunction with acupuncture in some patients.

GOING FORWARD

• Hunch: We don't do enough treatment

- Expand and extend treatment
 - Ear stim

• Jaqueline Filschie type protocols

GOING FORWARD

Better define, segment, and determine best practices
Response to needling more subtlety, complexity aspect

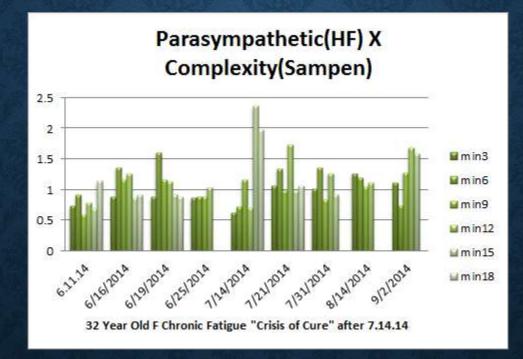
- Explore the "swings" with needling
- Use more Chinese Medicine frames

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STRENGTHENING THE WEB