Justice Resource Institute (JRI) Trauma Center Trauma Sensitive Yoga (TCTSY): Evidence Base and a Demonstration

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WHAT IS TRAUMA CENTER TRAUMA

Overcoming Trauma through Yoga
Reclaiming Your Body

Pearls from Video with David Emerson and Elizabeth Hopper

- TCTSY is:
- For complex trauma
- Moving treatment beyond cognition to level of body
- Empowering
- Encourages interoception
- Invitational
- No touching/assists
- Choice/Effective Action
- Provides an environment that is safe, predictable and stable
- No right or wrong way
- Rebuilding ownership

Today’s Session will:

- Provide an update to the neurobiology of trauma: interconnection and primarily subcortical
- Suggest a perspective of hope
- Describe the evidence base for the efficacy of TCTSY
- Provide a demonstration of TCTSY
- Highlight how TCTSY differs from other yoga offerings

INTERCONNECTION.....

HYPOTHALAMIC PITUITARY AXIS

SOURCE: http://dl.ia203.uf.ualr.edu/image/17154E39-4F8F-45024AD1/195
HYPOTHALAMIC PITUITARY AXIS

HPA axis
- Hypothalamus triggers the release of
  CRH (Corticotropin releasing hormone) which activates the
  Pituitary Gland which releases the hormone
  ACTH (Adrenocorticotropic hormone) which is carried by the
  Adrenal gland which releases stress hormones
  Cortisol/Adrenalin and Noradrenalin
- To assist the body deal with the stressor

Source: https://www.google.com/search?hl=en&site=imghp&tbm=isch&source=hp&biw=1440&bih=728&q=HPA+axis&oq=HPA+axis&gs_l=img.3...870.3388.0.3889.0.0.0.0.0.0.0.0..0.0....0...1ac.1.64.img..0.0.0.F2na-fuhKE8#imgrc=dpeJHQ8-CZ74KM:

HPA RESEARCH PEARLS

- 2015 study n=138, ages 9-16. Kuhlman, Varga, Geiss and Lopez Duran measured salivary cortisol levels. Their findings suggest that dysregulation of the HPA as demonstrated by variations in cortisol might depend on the type of ELS experienced by the child: emotional abuse, physical abuse, unintentional trauma appeared to result in differences. Age at ELS experience may influence how the HPA is affected.
- While HPA studies suggest much further work to be done, the surface has yet to be scratched on the HPG (Hypothalamus-Pituitary-Gonadal) Axis.

INFLAMMATION

• Pro Inflammatory Cytokines are produced by the immune system in response to threat
• Dysregulated HPA results in dysregulated immune system: excess cortisol may promote infection, too little cortisol may cause inflammation to persist longer than necessary (i.e., in adrenal fatigue)


INFLAMMATION RESEARCH PEARLS

- Literature is replete with suggestions for how inflammation may be influencing the host of systemic responses identified in ACEs: (i.e., heart, diabetes)
- Interleukin 6 (IL-6) and C-Reactive Protein (CRP): Inflammatory markers that may be correlated with ELS.


INFLAMMATION RESEARCH PEARLS (CONT’D)

- IL-6 and CRP may be especially implicated in depression – both in children soon after experience of ELS and in adults years following ELS.

OXYTOCIN

- A neuropeptide identified in 1906, its molecular structure in 1952.
- Functions both as a hormone and a neurotransmitter
- Produced in hypothalamus, stored/released by pituitary
- Long associated with childbirth and lactation
- Modulates social cognition, empathy, emotional regulation and motivation – critical: Attachment

OXYTOCIN RESEARCH PEARLS

- Oxytocin may have a mitigating effect on reactivity of the amygdala

- Oxytocin may affect males differently than females

- The higher the ACE score, the lower the circulating oxytocin in women

Oxytocin Research Pearls (cont’d)

- Oxytocin may be anti inflammatory. May play a role in the development of depression due to effects on the HPA axis and immune system.
- Oxytocin may play a pivotal role in the epigenetic transmission of trauma with both pre and post natal effects.
- Lower circulating oxytocin correlates with lower attachment behaviors

GENETICS

- Definition: the science of heredity, dealing with resemblances and differences of related organisms resulting from the interaction of genes and environment.
- Term first proposed by biologist William Bateson in 1905.

Genetics Research Pearls

- The link between environment and genes suggests ELS “turns on” specific genes. Severity/chronicity of ELS may be correlated to severity/chronicity of depression, anxiety and mood disorders.

- Telomeres may shorten with exposure to ELS.

Genetic Research Pearls (cont’d)

- A specific gene component, FKBP5, may be implicated in ELS. In the presence of ELS, it may decrease the number of glucocorticoid receptors: decreasing sensitivity to cortisol, and reducing the negative feedback loop of the HPA axis – promoting the relentless release of cascading hormones.

EPIGENETICS

- Definition: “the study of changes in organisms caused by modification of gene expression rather than alteration of the genetic code itself”
  - https://en.oxforddictionaries.com/definition/epigenetics
- What is the difference between “genetics” and “epigenetics”
- Methylation, the attachment of methyl groups to the gene, appears a primary mechanism in the modification of a gene exposed to ELS
EPIGENETICS (cont’d)

- Methylation silences a gene.
- Methylation may be heritable.
- Methylation may be reversible.
- Oxytocin in intergenerational transmission of ELS – a double whammy
  - Prenatal
  - Postnatal


PHOTO: Brain Imaging: Circuitry

Brain Imaging: volume

Left: hippocampal volume normal
Right: hippocampal volume history of abandonment


Research Pearls: Brain Imaging

- Two primary areas of current research:
  1. Different ELS affects different areas of brain
     - Heim, 2013. Those experiencing child sexual abuse showed changes in genital somatosensory areas. Those experiencing emotional abuse showed atrophy in cortical areas influencing emotion and self-awareness (anterior cingulate, precuneus parahippocampal gyrus)


PHOTO: Brain Imaging: Circuitry

Research Pearls: Brain Imaging

- An exception: Amygdala volume may increase with exposure to ELS (instead of pruning, there is expansion of circuitry related to fear and vigilance)
- Age may make a difference: There may be critical times in human development that intensify brain modification when exposed to ELS: (2014) n=18 age: 25.4 +/- 3.1 yrs. Amygdala volume most affected with ELS between 10-11 years.

Research Pearls: Brain Imaging

- Age may make a difference:


INTERCONNECTION…..

Positive Psychology

“Research has shown that positive emotions and interventions can bolster health, achievement, and resilience, and can buffer against depression and anxiety.…. And while considerable research in neuroscience has focused on disease, dysfunction, and the harmful effects of stress and trauma, very little is known about the neural mechanisms of human flourishing. - Martin Seligman

Source: The Positive Neuroscience Project (www.posneuroscience.org) was established in 2008 by Professor Martin E.P. Seligman, Director of the Penn Positive Psychology Center

“HOPE IS NOT A FOUR LETTER WORD”
- Ben Pasek, lyricist for LaLa Land


ALWAYS REMEMBER…..

You are braver than you believe, stronger than you seem, and smarter than you think.

Christopher Robin to Winnie The Pooh
"No intervention that takes power away from the survivor can possibly foster her recovery, no matter how much it appears to be in her immediate best interest".

- Judith Herman


2014. Randomized Control Trial (RCT)
- Title: Yoga as an Adjunctive Tx in Post Traumatic Stress Disorder: A Randomized Control Study
- Journal of Clinical Psychiatry. 75(00). Doi: 10.4088/JCP.13m08561
- Authors: Van der Kolk, B.A., Stone, L., Rhodes, A., Emerson, D., Duvall, M., & Spinazzola, J.
- Purpose: to explore the efficacy of yoga in increasing affect tolerance and decreasing sx of PTSD in women with treatment resistant PTSD.

N=64. Age: 42.9 +/- 12 years. Gender: all women. Half to TCTSY and half to education group. Met weekly for 10 weeks

Control Results: After initial decline in PTSD sx returned to baseline. 6 of 29 (21%) no longer met PTSD criteria. Sustained improvements in depression scales (community?)

Yoga Results: Yoga group sustained initial decline in PTSD sx. 16 of 31 (52%) no longer met PTSD criteria by close of study. Depression scales not statistically different from Control = improved.

2015. Hermeneutic Phenomenology Study
- Definition: The purpose of hermeneutic phenomenological research is to bring to light and reflect upon the lived meaning of basic experience. Researchers attempt to describe phenomena as they appear in everyday life before they have been theorized, interpreted, explained, and otherwise abstracted. (source: https://lips-wordpress.com/2014/10/16/introduction-to-hermeneutic-phenomenology-a-research-methodology-best-learned-by-doing-it/)
- Title: Claiming Peaceful Embodiment through Yoga in the Aftermath of Trauma

Complementary Theories in Clinical Practice, 21, 247-256. doi: http://dx.doi.org/10.1016/j.ctcp.2015.09.004
- Author: Alison Rhodes
- Purpose: to describe the experiences of practicing yoga and its role within processes of healing for adult women with complex trauma histories
- Follow up to 2014 RCT. n=39 (of original 64). Complex trauma
Study Results: Interview analyses indicated themes of improved sense of connection, ownership and control over the body, emotions and thoughts.

A growing sense of self-efficacy, and feelings that they were no longer defined by their trauma history, living in the past or reacting based on the past.

Interoception can accentuate the disconnect between mind and body — noting this, modifying practice to increase tolerance of negative reactions, noting transiency of discomfort/triggers = empowering

Purpose: study revised protocol of the 2014 RCT expanded to 20 weeks with addition/monitoring of home practice

N=9 (6 completed). Age: 25-55 y. Gender: F. Like prior studies, treatment resistant, chronic PTSD

Assessed twice before, 3x during and twice after

Results: 83% of those who completed (5 of 6) no longer met criteria for PTSD. Marked decrease in dissociative sx, suggesting longer duration may assist in reducing dissociation.

What Next?

Implications for children….

APPENDIX: BRAIN ANATOMY

The following slides are included in handouts to assist the viewer in anatomy review.
**Brain Structures: Amygdala, Cortex**

- Amygdala: Involved in dealing with fear and stress.

**Brain Structures: Parahippocampus**

- Function: Creation and recall of visual scenes. Subtle communication cues like sarcasm, inflection.

**Brain Structures: Anterior Cingulate**


**Brain Structures: Precuneus**

- Function: Visuospatial memory, experience of agency, self-related, communication.
- Disorders: Borderline PD (Dissociation, right hemisphere), Anorexia Nervosa, Schizophrenia.