Guided Imagery Intervention for Stress and Pain in Adults with Sickle Cell Disease

Miriam O. Ezenwa, PhD, RN
Associate Professor
University of Florida
- **Pain**, the hallmark symptom of sickle cell disease (SCD) affects the QOL and productivity.

- Stress is a known **trigger** for the acute pain crisis of SCD.
  - Little is known about the **effects** or mechanisms of stress-reduction treatment in adults with SCD.

Guided by the hypothalamic-pituitary-adrenal (HPA) axis theory, the purpose of this pilot study was to test the feasibility of a GI stress reduction intervention protocol in adults with SCD.
The HPA theory posits that stress is associated with over-activation of neurotransmitters and hormones (e.g., cortisol, norepinephrine, and epinephrine) that cause flight-or-fight responses and intensify responses to pain.

- Therefore, GI is expected to reduce self-reported stress and pain
- Cortisol will serve as a biomarker of the physiological response underpinning the self reports
2-phase, attention control pre-post randomized clinical trial
- Focus today: **Phase 1**
Sample Characteristics

- Sample: **27** adults with SCD
- Median age: **32 years ± 10**
  - [Range: 21-59 years]
- **85%** African Americans
- **70%** women
Patients completed PAINReportIt® questions regarding:

- **Pain** and **Stress** measures:
  - Current pain
  - Current stress
  - Patients provided swab derived **saliva** samples for cortisol measurements at **0 min** and **30 mins**
**Measures**

- **Experimental Condition:**
  - **Six** video clips (2-min, 5-min, 8-min, 10-min, 15-min, and 20-min length)

- **Demographics**
Analysis

- Linear regression along with bootstrapping
  - Determine the effects of GI on current stress, current pain, and cortisol concentrations
- Salivary cortisol: Measured in duplicate by enzyme-linked immunosorbent assay (ELISA)
Results

- Feasibility of Guided Imagery Protocol
  - 96%: Consented patients participated and completed the study
  - 96%: Study was acceptable to them
  - 100%: Questionnaire items were completed
Potential Efficacy of Guided Imagery Protocol

- Statistically significant effects of GI on:
  - Current stress \( (t = -2.18, p = .03) \)
  - Current pain \( (t = -2.65, p = .01) \)
- Stress and pain were lower for the GI group than the control group
The effects of GI on cortisol concentrations not significant

- GI group scores improved more than the control group following the intervention compared to the control group.
- Cortisol concentrations varied considerably in this small sample.
  - Despite random assignment to groups, the GI group had considerably higher concentrations at baseline.
Conclusions

- Study protocol was **feasible** in this vulnerable population
- Based on results:
  - Determined the **effect size** for the GI intervention and calculated the **sample size** needed to conduct an efficacy trial of GI intervention using this protocol in adults with SCD; and
  - To extend it to a **longer-term** study with patient using the mobile GI anywhere and anytime they encounter stressful situations
Findings from this promising feasibility study show that:

- Patients **kept** the scheduled study appointments
- Completed a **simple** and **cost-effective** trial of GI intervention on the mobile tablet device
  - The GI intervention reduced the impact of **stress** on SCD pain
Findings thus far consistent with the HPA axis theory and support our hypothesis that a single 12-min GI intervention session is sufficient to reduce current stress and pain.

- GI could be used to control pain during emergency department and acute care center visits while patients are waiting to be evaluated for further pain management.
Conclusions

- Findings have potential to inform cognitive-behavioral strategies for stress and pain reduction in this vulnerable population.
References

6. Enzyme-linked immunosorbent assay (ELISA) Salimetrics, State College, PA.
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Investigators & Research Team:

**Investigators**
- Yingwei Yao, PhD
- Robert E. Molokie, MD
- Christopher G. Engeland, PhD
- Zaijie Jim Wang, PhD
- Diana J. Wilkie, PhD, RN, FAAN

**Current Team**
- Marie L. Suarez, PhD
- ZhongSheng Zhao, PhD
- Riggo Angulo, BA
- Jesus Carrasco, BS
- Veronica Angulo, BA