

SPECIAL ISSUE

Autonomic Mediation of Stress-Related and Anxiety Disorders Using Heart Rate Variability Biofeedback

Richard Gevirtz, PhD, BCB

Alliant International University, San Diego, CA

Keywords: functional disorders, biofeedback, heart rate variability

This article briefly describes a cardiorespiratory type of biofeedback called heart rate variability biofeedback. The rationale for the technique is outlined and the protocol described. Gevirtz (2013) has reviewed the HRVB outcome literature up to 2013. For a more theoretical paper see Lehrer & Gevirtz (2014).

Heart rate variability biofeedback (HRVB) is a noninvasive procedure aiming at self-control of breathing patterns and cardiac response. It aims to enhance the parasympathetic response (vagal reaction) and diminish the sympathetic response. The results presented here reveal the beneficial outcomes in a number of autonomic nervous system dysfunctional conditions such as irritable bowel syndrome or complex conditions such as muscular pain and headaches. The overall benefits continue to prevail clinically with ongoing personal or individual practice (Nimnuan, Hotopf, & Wessely, 2001).

Disorders such as irritable bowel syndrome (ICD9 code 564.1), chronic muscular pain (729.1), chronic headache (784.0, 307.81, 784.0), or various versions of dysautonomia (337.9) are very prevalent in medical populations (10%–20%). Anxiety disorders with predominant physical symptom presentation are also very prevalent (10%–15%).

Summary of the Objective Investigation Procedure

Using psychophysiological measures, especially heart rate variability measures, we can profile the likely contribution of poor autonomic homeostasis as a mediator of symptoms. The usual protocol involves 5–10 minutes of baseline beat-to-beat heart rate data, a short stressor interval, and a 5-minute recovery. The usual protocol is an abbreviation of a 24-hour Holter monitoring procedure.

For the salient measures of interest (time and frequency domain measures), 5-minute samples have been found sufficient. At the same time, skin conductance (a galvanic skin response), finger temperature (indicating sympathetic

activation of peripheral vasculature), and forehead electromyograph (average motor activation of facial muscles), are monitored. The primary clinician usually administers and interprets the data. The treatment protocol involves the following.

Session 1

History and psychophysiological stress profile: A history is taken that focuses on possible emotional triggers of the presenting symptoms along with a detailed description of the actual symptoms. The stress profile is used to look for autonomic patterns such as excessive sympathetic activation, poor vagal regulation, or combinations of the above.

Session 2

Finding resonance frequency (RF): Find the slow breathing frequency that produces the most dramatic fluctuations in heart rate and the greatest shift away from sympathetic to parasympathetic activity. The patient is instructed to breathe at a specific frequency, usually beginning at seven breaths per minute and sequenced down in steps to five breaths per minute. Indicators of RF include the size of the peak/valley difference in heart rate for each breath cycle, the smoothness of the heart rate tracing over time, and other autonomic indicators. Once RF is established, the patient is sent home to practice with available apps or music pacers.

Sessions 3–8

Continued feedback and coaching to assure mastery of the skills: At each session the symptoms are reviewed and the patient continues to practice the slow breathing technique to improve the amplitude and smoothness of the heart rate tracing. When necessary, it can be combined with evidence-based therapies such as cognitive behavioral therapy, acceptance and commitment therapy, etc.

Clinical Results

Results depend on the disorder being treated. For functional gastrointestinal disorders in children, the treatment is very

effective (70%–80% no longer meet ICD-9 criteria). For other disorders, the treatment is very effective (40%–60% no longer no longer meet ICD-9 criteria).

Conclusions

HRVB is a powerful, noninvasive, cost-effective tool for treating stress-related and anxiety disorders.

References

- Gevirtz, R. N. (2013). The promise of heart rate variability biofeedback: Evidence based applications. *Biofeedback*, 41(3), 110–120.
- Isaac, M. L. & Paauw, D. S. (2014). Medically unexplained symptoms. *Medical Clinics of North America*, 98(3), 663–672.
- Lehrer, P., & Gevirtz, R. N. (2014). Heart rate variability biofeedback: How and why does it work? *Frontiers in Psychology*, 5. doi:10.3389/fpsyg.2014.00756

- Nimnuan, C., Hotopf, M., & Wessely, S. (2001). Medically unexplained symptoms: an epidemiological study in seven specialities. *Journal of psychosomatic research*, 51(1), 361–367.



Richard Gevirtz

Correspondence: Richard Gevirtz, PhD, BCB, 10455 Pomerado Road, San Diego, CA 92131, email: Rgevirtz@alliant.edu.