

Using Biofeedback in HIV+ Patients

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Abstract

Background - The prevalence of HIV in Washington, DC is estimated to be at least 3%, triple what the World Health Organization defines as an epidemic. Even at that conservative estimate, the number of people living with HIV in the District of Columbia is the highest in the nation. Individuals living with HIV face stigma, anxiety, stress and depression, among a host of other physical and mental effects. Biofeedback is a technique that trains people to improve their health by controlling certain bodily processes that normally happen involuntarily, such as heart rate and blood pressure, usually through deep breathing and relaxation techniques.

Objective – The objective of this project was to work with a small group of HIV+ patients to examine the effects of biofeedback on stress and anxiety levels and heart rate variability, as well as to equip them with a new tool to cope with stress. Additionally, this project serves as a small pilot program to determine how best to implement a similar program on a larger scale. This project fulfills the summer project requirement for the Integrative Medicine Track at the GW School of Medicine and Health Sciences.

Methods – For this project, I worked with three HIV+ patients at Bread for the City under the supervision of Dr. Randi Abramson (Medical Director of Bread for the City). Five 30-minute biofeedback sessions were conducted with each patient using the HeartMath iPad application. Additionally, two surveys (the Perceived Stress Scale and the PROMIS-29) were administered at the first and last session to assess emotional parameters such as stress, depression, and pain. One patient did not complete the final session or survey.

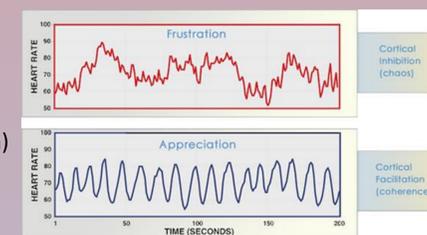
Results – While some survey parameters remained unchanged or worsened, certain parameters improved after the program. Additionally, all patients provided anecdotal evidence of the benefits they received from the program.

Conclusions – Important takeaways from this project are the implications of a large-scale program of this nature. Many challenges were revealed throughout the study, especially as it pertains to implementing a program like this in marginalized or oppressed populations. However, biofeedback is a simple technique that can be easily incorporated into a patient’s treatment regimen and can have significant benefits for interested patients.

Materials and Methods

For this project, I worked with three HIV+ patients at Bread for the City (Washington, DC.) All patients were to be at least 18 years of age with no history of unstable mood or psychiatric conditions, not currently pregnant, and with no history of atrial fibrillation/flutter. Each eligible patient was called, notified of the study and of these, three agreed to participate in the study. All participants signed an informed consent form at the beginning of the study and completed two surveys to assess various quality of life and emotional measures. The surveys used were the PROMIS-29 and the Perceived Stress Scale. Each patient was to come in once per week for five weeks for a 30 minute biofeedback session. We used the HeartMath iPad application with a clip-on ear sensor to assess heart rate variability and coherence. Heart rate variability is defined as the variation in the time interval between heartbeats. Coherence describes the pattern of HRV, with high coherence being desirable over medium or low coherence. Coherence can be thought of as a state of harmony or balance. For example, coherence can describe the synchronization of the breathing and heart rate or an efficient balance between parasympathetic and sympathetic nervous activity. Each patient was led through several different deep breathing and relaxation techniques such as gratitude breathing, attitude breathing, and abdominal breathing.

Figure 1. Example of coherence (HeartMath)



Results

Two patients completed all five sessions and both pre- and post-study surveys. Due to scheduling conflicts, the third patient completed four sessions and only the pre-study surveys. Anecdotally, all patients expressed the positive effects they experienced from the biofeedback program, such as stress relief and having a new tool to cope with stress. Some patients even reported practicing the breathing techniques on their own outside of the scheduled sessions, indicating that this skill can be easily taught in a short period of time. Some patients noted improvements in certain aspects of their mental well-being related to stress, anxiety and depression. For example, one patient reported improvements in feelings of worthlessness, depression, uneasiness, stress, and ability to cope with stress. Other patients reported either no changes or worsening of these parameters. On average, however, most parameters stayed relatively stable.



Figures 3, 4 and 5. HeartMath results from one session from each patient

Discussion

The purpose of this project was to conduct a small pilot study to assess the feasibility of implementing a biofeedback program in patients with HIV. While some of the quantitative data was inconclusive, all patients provided qualitative anecdotes of the benefits they received from the biofeedback program. We believe that implementing a biofeedback program in patients with HIV, other diseases or stressors in their lives is feasible with some changes from our methods. Additionally, we believe that programs such as these should take into account any unique challenges faced by the patient population, such as those related to income, transportation, housing, and literacy level. For example, in this study, it was difficult for patients to come in for sessions separate from their primary care appointments (due to transportation or financial troubles.) To make these programs more accessible and efficient for patients, a proposed change would be to conduct the biofeedback sessions directly after their primary care appointments with their physician while they are already at the office. Additionally, any paperwork given to the patient should be available in a form that is understandable by the patient, taking into consideration any literacy or language challenges. However, we believe that biofeedback is a relatively simple treatment modality to integrate into a patient’s treatment plan and that it can have great benefits for patients with any stressors in their lives.