

Applied Bi-Lateral Alternating Stimulation- Tactile (BLAST) as a Stress Inhibitor

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Emerging scientific evidence shows applied bi-lateral alternating stimulation- tactile (BLAST) has unique physiological and psychological benefits that have not yet been available as a consumer product. BLAST can be used to inhibit the human stress response and enhance memory recognition, both in and outside of the therapeutic context, and this application has many advantages including being passive, fast-acting, and non-invasive. BLAST's origins began as a component of Shapiro's EMDR Therapy (Shapiro & Solomon, 1995) and was later used as psychological exposure with accupoint tapping and the Emotional Freedom Technique to produce incremental benefits beyond talk therapy approaches (Feinstein, 2010; Wells et al., 2010). Although existing research is primarily focused on subjects with post-traumatic stress disorder (PTSD), BLAST's positive effects on the human stress response system can be used outside of the therapy session as a cost-effective adjunct to therapeutic treatment or a stand-alone methodology to improve individual's lives.

Research

Scientific evidence suggests that BLAST produces a distinct effect during therapy sessions beyond other methods of stimulation. The effects of alternating vs. continuous stimulation were shown in Servan-Schreiber, Schooler, Dew, Carter, and Bartone's 2006 study wherein they found a statistically significant additional benefit from alternating rhythmic sensory stimulation (both auditory and tactile) vs. simultaneous rhythmic stimulation or continuous stimulation in patients undergoing treatment for PTSD.

Nieuwenhuis, Elzinga, Ras, Berends, Duijs, Samara, and Slagter's 2013 study examined differences in the effects of normal memory retrieval in subjects and compared bi-lateral saccadic eye movements, BLASTs, and alternating bi-lateral auditory stimulation and found that there was a significant beneficial effect on normal memory retrieval in both the eye movement and BLAST conditions, but not the auditory condition. The results were consistent with the alternating hemispheric activation hypothesis (Propper & Christman, 2008), that predicts the alternating left-right bi-lateral nature of the eye movements and tactile stimulation may have produced a positive effect because the visual and somatosensory systems are strictly contralaterally organized whereas the auditory system is less contralaterally organized. According to the hypothesis, rapidly alternating patterns in the two hemispheres might increase interhemispheric interaction. The study supports what EMDR clinicians have observed in that stimulation on one side of the body or simultaneous stimulation does not produce similar effects. The bi-lateral and alternating stimulation appears to be necessary to produce specific desired effects.

Harper, Rasolkhani-Kalhorn, and Drozd's (2009) eeg study on subjects with PTSD found BLAST created a significant effect on depotentiation of the fear memory synapses in the amygdala. Although eye movements and BLAST were both used in this study, participants' eyes were closed for the eeg recording time and BLAST was utilized during more processing time. The result was significantly lowered reports of distress along with changes in low frequency rhythms in brain networks associated with memory that were more closely associated with calm/sleep states. The limitations in this study are that that BLAST

was not used alone as a separate condition and that distressing memories were provoked during EMDR processing. Our archival eeg data suggests that when BLAST is applied and before/after z-score LORETA analysis is used, there are significant changes in amygdala, insula, and somatosensory function that could explain how BLAST seems to de-escalate whatever stress response is already occurring, and how it also lessens or eliminates body sensations associated with distressing recall or physical pain. Lubar (2016, personal communication) reviewed these data and concurred.

Ehrlich, Humeau, Grenier, Ciochi, Herry, and Lüthi, (2009) summarized the inhibitory circuitry in the amygdala and its importance in the body's stress response. The amygdala appears to have intrinsic connectivity and interactive capabilities to other key brain structures to integrate sensory inputs, generate fear response outputs, modulate fear responses according to circumstances, and create the extinction of fear (Pitkanen et al., 1997; Sah et al, 2003 cited by Erlich, et al. 2009). It is widely recognized that the amygdala is a key area in modulating the body's stress response. Therefore interventions that alter amygdala activity should be able to change the body's ability to activate the stress response in real-time.

Additional archival data from my clinic was analyzed with unpaired t-tests (n=24) on adults ages 21-47 who were asked during the course of a typical EMDR session about their levels of distress (0-10) and levels of distressing body sensations (0-10). We took a random sample of 12 who were using BLAST and 12 who were not using BLAST and compared the results. Clinicians were not blinded to the condition because the data were collected during the normal course of therapy. The mean difference between the subject's initial distress and their reported distress between 10 and 30 seconds later was used to calculate the unpaired t-test. The two-tailed P value >0.0001, which is extremely statistically significant. The mean difference was 3.50, with a 95% confidence interval difference between 2.38 and 4.62. $t = 6.4807$, $df = 22$, and the standard error of the difference = 0.540.

Group	Group One	Group Two
Mean	5.25	1.75
SD	1.22	1.42
SEM	0.35	0.41
N	12	12

We are in the process of replicating this study using a double-blind, placebo controlled design.

Discussion

Although BLAST has been used as a component of EMDR Therapy and research shows distinct effects, it appears to be vastly underutilized as a stand-alone method for inhibiting the body's stress response. Individuals without PTSD also experience daily stress that can be modulated within seconds by BLAST. Prior research and clinical report indicate that BLAST can reduce psychological and physiological pain and distress, enhance memory retrieval, and alter electrical activity that may promote a sense of calm and sleep onset. Because BLAST application is relatively inexpensive and patent-pending technology can be incorporated into a portable device, it provides a simple, non-invasive, inexpensive way to alter the stress response and improve functioning as either an adjunct to therapeutic treatment, or as a stand-alone intervention.

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