A Pilot Study to Determine the Effectiveness of Equine Assisted Therapy (EAT) in Children with Autism as Measured by Changes in Heart Rate Variability (HRV)

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Background

Children diagnosed with Autism Spectral Disorder (ASD) exhibit exaggerated stress responses and significant elevations of the stress hormone cortisol. Co-occurring anxiety and increased stress response could compound the overall social, emotional and cognitive deficits associated with ASD. Equine Assisted Therapy (EAT) has been successfully used to increase sensory seeking and sensitivity, social motivation and to reduce inattention in children with ASD. However, whether the benefits of EAT in children with ASD are accompanied by a reduction in the levels of stress is not known.

Heart rate variability (HRV) is a non-invasive measure used to assess the stress response in humans. The present pilot study explored the relationship between EAT and heart rate variability (HRV) in children with ASD.

Eleven males and three females (ages 9 to 16) were tested at least once within an 8 week period. The study was conducted first at the TERI’s Therapeutic Equestrian Program in Vista, California and at TERI’s Campus of Life Therapeutic Riding Center located in Fallbrook, California.

Methods

Physiological measurements (EKG) were obtained with a Polar Human RS800CX Heart Rate Monitor for 5 minutes during three sessions before (baseline), during (horse riding), and after completion of the session (post)). HRV was measured by calculating SDNN (standard deviation of the normal to normal heart beats). Participants were divided into Group 1 (one or two sessions) and Group 2 (Three or more sessions) based on the number of sessions attended within an 8 week period. One –way ANOVAs were used for statistical analysis.

The pilot study addressed two issues:

A. Consequences of the initial EAT session on HRV (baseline vs. post).

B. Consequences of repeated exposure of EAT on HRV (baseline vs. post).

Results

HRV levels in the total sample showed a non-significant increase in HRV following their first experience with EAT wearing the Polar Heart Rate Monitor (n=14; F(1,27) =0.2, p > 0.05). HRV
levels before (BLUE) and after (RED) EAT. Figure shows means of one or two sessions for Group 1 or three or more sessions for Group 2. Sessions had to be attended within an 8 wk period (Figure 1-3).

![Figure 3: Comparison of increase in HRV with repeated EAT sessions.](image)

Participants attending three or more sessions of EAT produced a greater increase in HRV than participants who attended one or two sessions within an 8 wk period (Group 1=10; Group 2=4; F(1, 14)= 5.7, p < 0.05).

**Conclusion**

Repeated and frequent participation in EAT may be an effective approach to increase HRV in children diagnosed with ASD and thus contribute to a significant decrease in stress responses associated with ASD.

**Further Research**

This was a pilot study and the researchers intend to increase the sample size, the comparison of frequency of EAT sessions, and examine the HRV results of EAT sessions with riding therapy protocols.

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