Bhoomika Ahuja

T. M. Graber Teaching Fellowship Award 2014-15

AAO Foundation Final Report Form

Type of Award: **Orthodontic Faculty Development Fellowship Award (T. M. Graber Teaching Fellowship Award 2014-15)**

Name of Principal Investigator: **Bhoomika Ahuja, BDS, MS**

Title of Project: **Genioglossus Activity and Fatigability in Patients with Upper Airway Resistance Syndrome and Obstructive Sleep Apnea**

Period of AAOF Support: **07/01/2014 to 06/30/2015** (No Cost Extension was granted from 07/01/2015 to 04/30/2016)

Amount of Funding: **$14,680.00**

Summary/Abstract:

Obstructive sleep apnea (OSA) is a common type of sleep breathing disorder (SBD) in children. OSA is part of sleep breathing disorder (SBD) spectrum which also includes primary snoring, upper airway resistance syndrome (UARS), and obstructive hypopnea syndrome, with snoring being the mildest form and OSA the most severe form. Primary snoring shares similar predisposing factors and some of the morbidities of OSA. It is found that genioglossus EMG activity during wakefulness is greater in OSA group compared to control group. However, there is no study that compared patients with primary snoring or UARS to either OSA or control groups.

This study compared genioglossus activity and fatigability in children with OSA, children with snoring/UARS, and children without any SBD during quiet/deep breathing and maximum tongue protrusion. Data was obtained from a total of 20 subjects. During quiet breathing, OSA group had an average EMG signal of 0.185 mV.s, snoring/UARS group had 0.173mV.s, and control group had 0.168 mV.s. However, the differences in values were not statistically significant. During deep breathing, OSA group showed EMG signal of 0.456 mV.s , snoring/UARS group had 0.360 mV.s and control group had 0.164mV.s. Difference between OSA and control groups were statistically significant. However, differences between OSA and snoring/UARS group or snoring/UARS group to control group were not statistically significant. During maximum tongue protrusion, OSA group had EMG activity at 0.144 mV.s, snoring/UARS group had 0.226 mV.s , and control group had 0.220 mV.s. There was no significant difference between any groups. There were no statistically significant differences in fatigability as well. Although statistically not significant, snoring/UARS group had EMG values intermediate of Control and OSA group, which is expected because snoring is a milder form of OSA. In conclusion, EMG could potentially provide additional tool to differentiate patients with various types of sleep disordered breathing.

Response to final report questions:

1. Were the original, specific aims of the proposal realized? Not completely. Due to lack of funding support for the MRI scans, no MRI was performed on any of the enrolled participants. Only Electromyography (EMG) studies were performed on genioglossus muscle for all participants.

2. Were the results published? No Results have been published yet. Data collection was completed March 2016 for a total of 22 participants. These results will be complied into a manuscript and submitted for publication. We expect to submit for publication in August 2016.

3. Have the results of this proposal been presented? No the study has not been presented at this time since data collection and analysis was completed in March 2016.

4. To what extent have you used, or how do you intend to use, AAOF funding to further your career? AAOF funding was used to purchase EMG machine ($12,000.00) and associated equipment for the study and to train the research team for data collection using the machine. 22 patients received a compensation of $57.00 each for their participation. Training for the research team was also completed using AAOF funds ($2,000.00). The additional costs were covered by the UMB orthodontic department.