

## AAO Foundation Award Final Report

Type of Award: Orthodontic Faculty Development Fellowship Award

Name of Principal Investigator: Ahmed Ghoneima

Title of Project: Craniofacial abnormalities and airway dimensions in Down syndrome patients

Period of AAOF Support: (07-01-14 to 06-30-15)

Amount of Funding: \$ 15,000

### Summary/Abstract:

The aim of the current project was to assess the skeletal structures and airway volumes in children with Down syndrome (DS) as compared to children without DS. Methods: Following IRB approval and reliability tests, 20 cone beam computed tomography scans (CBCTs) for children with DS and without DS (all male aged 10-15 years, n=10 per group) were compared in regards to a total of 22 parameters (7 airway volumes, 5 soft tissue thickness of airway and 10 skeletal). Measurements were recorded using 3D Dolphin Imaging Software. Intraclass correlations (ICC) were performed on duplicate measures of 10 CBCTs. Parameters were compared between DS and non-DS subjects using paired t-test. Statistical significance was set at  $p \leq 0.05$ . Results: ICC values were  $\leq 0.90$  for all parameters. Significant differences were detected in all parameters except for the mandibular length (Co-Gn). DS subjects showed significant decrease in airway parameters and increase soft tissue thickness of the airway as compared to control subjects. Maxillary sinus volumes of DS subjects were significantly smaller than normal subjects. The average size of the most constricted area of the airway in DS subjects was about 44% as compared to the control subjects. Statistically significant decreases were detected in Co-A, SNA, ANB° and A $\perp$ N, while statistically significant increases were detected in Ba-S-Na, SNB, B $\perp$ N, MP-SN and ANS-Me. Conclusions: DS subjects showed significant decrease in airway volumes, most constricted area of the airway, increase in soft tissue thickness, hyperdivergent mandible, and increased lower anterior facial height compared to the control subjects.

Response to the following questions:

1. Were the original, specific aims of the proposal realized?

Yes

2. Were the results published? If not, are there plans to publish? If not, why not?

Manuscript is being prepared for submission to the AJODO

3. Have the results of this proposal been presented? If so, when and where? If not, are there plans to do so? If not, why not?

The results of the current project were presented at:

-IADR/AADR March 2015-General Session in Boston, Mass.

- Citation: A. Ghoneima, J. Mnayarji, R. Roper, K. Kula. Craniofacial abnormalities and airway dimensions in Down syndrome patients. IADR/AADR/CADR General Session and Exhibition 2015; 03/2015

-Indiana University Research day April 2015- Indianapolis, IN

-Results will be presented at the Burstone symposium annual meeting October 2015 – Indianapolis, IN.

- Title of presentation: A. Ghoneima. 3D imaging: revealing the hidden information.

4. To what extent have you used, or how do you intend to use, AAOF funding to further your career?

The award provided me with the necessary fund for the successful completion of the project. The fund has also assisted me paying part of the tuition for my part-time faculty advanced standing orthodontic residency program. I consider both the program and the project two major steps in enhancing my career. I was honored to be the recipient of the AAOF award that supported me during this critical period of my career establishment.