

Presenting Author Name

Bresham Malik

Phonetic spelling of your (full) name

Buh-ray-shum

Presenting Author Category

Non-Trainee

Supervisor Name

Geoffrey Hicks

Research Category

Clinical

Abstract Title

Novel FASD Cephalometric Malocclusions in Children Diagnosed Across the FASD Spectrum

Authors

Name	Role	Profession
Berardino Petrelli	Co Author	Graduate
Bresham Malik	Presenting Author	Technician
Molly Pind	Co Author	Research Associate
Ana Hanlon-Dearman	Co Author	Full Professor
Albert E. Chudley	Co Author	Full Professor
William Wiltshire	Co Author	Full Professor
Milos Lekic	Co Author	Dentist
Christie Laberge	Co Author	Dentist
Robert Balshaw	Co Author	Assistant Professor
Noriko Boorberg	Co Author	Associate Professor

Geoffrey G. Co Author Full
Hicks Professor

Background

Fetal Alcohol Spectrum Disorder (FASD) is one of the most acquired neurodevelopmental disorders in the world, affecting 3% of children. FASD sentinel facial features play an important role in the identification and diagnosis of FAS, the most severe form of FASD. A novel finding in our FASD mouse model, maxillary malocclusions, suggested that orthodontic radiograph measurements in children may serve as a new tool in identifying risk of FASD outcomes.

Objective

To create an objective quantitative criteria that can identify children with FASD across the entire spectrum.

Methods

We performed a retrospective study using clinical patient chart data from pediatric and orthodontic dental clinics in Winnipeg, Manitoba. Our FASD cohort comprised of 15 diagnosed subjects: four FASD with (3 FAS, 1 pFAS), and eleven FASD without sentinel facial features, as compared with 15 healthy but orthodontically treated children. The cohorts were matched for age, sex, ethnicity, and the age range was 7-15 years. Lateral cephalogram radiographs, commonly used for orthodontic treatment, were used to obtain 74 measurement candidate predictors.

Results

74 candidate predictors were included in an elastic net logistic regression analysis that selected 13 active predictors, 5 of which were positive and 8 negatively associated with FASD. The 5 predictors positively associated with FASD were: extraction index, Pt - A (vertical), Or - A (vertical), Or - ANS (vertical) and Co-Go length. The final model achieved an optimism-corrected area under the receiver-operating characteristic curve (AUC) of 0.909 with a specificity and sensitivity of 93.3%. Clinically, individuals across the FASD spectrum consistently presented with midfacial hypoplasia, a retrognathic mandible, and a Skeletal Class II malocclusion.

Conclusion

This sets up future studies to determine if a lateral cephalogram can be used as a new early assessment tool alongside current FASD diagnostic criteria to better identify PAE and risk of FASD outcomes.