

AAO Foundation Award Final Report

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Award Type	Orthodontic Faculty Development Fellowship
Project Title	Genetic Determinants of Craniofacial Characteristics
Project Year	2000
Institution	Case Western Reserve University
Summary/Abstract	<p>As a first step in establishing the feasibility of using genetic epidemiological methods in determining the genetic basis for cranio-oro-facial phenotypes, a simple and easily observable clinical trait was chosen for investigation: maxillary midline diastemas.</p> <p>The purpose of the study was to estimate familial correlations and heritability (h^2) in order to evaluate familial aggregation patterns of maxillary midline diastemas (MMD). The sample consisted of 30 extended families, 15 African American (AA), 14 Caucasian (CA), and 1 mixed race family. A single ascertainment scheme was adopted to collect the sample. Familial data were collected using a seven-question survey. In all, the sample of 430 subjects consisted of 220 females, 210 males, 99 nuclear families, 534 sibling pairs, 422 avuncular pairs, 318 grandparental pairs, and 27 cousin pairs. Families were stratified by race to avoid any bias present due to race. The mixed race family was excluded from the analysis. Data were analyzed using the program REGC in the Statistical Analysis for Genetic Epidemiology (S.A.G.E.) software. Heritability was found to be 0.32 ± 0.14 in the CA sample and 0.04 ± 0.16 in the AA sample. The preliminary results suggest a possible genetic basis for MMD and a greater role of environmental factors in the AA sample compared to the CA sample.</p> <p>Publications and abstracts that resulted from the AAOF grant:</p> <p>Genetic Epidemiology; Dental Phenotypes in Focus. <u>Valiathan M</u>, Tiwari HK, Elston RC, Hans MG. Vol.39; Craniofacial Growth Series. <i>Ed.</i> JA McNamara Jr and K Kelly. 2002, Pg. 237-255</p> <p>Familial Correlations and Heritability of Maxillary Midline Diastema.</p>

Gass JR, Valiathan M, Tiwari HK, Hans MG and Elston RC. Am J Orthod Dentofacial Orthop 2003;123 (1):35-39.

The etiology of palatally displaced canines; the evidence examined.

Moullas A, Valiathan M, Tiwari HK , Elston RC. Abstract number 1663. Journal of Dent Res: (81) pg A-220, 2002.

The Heritability of Maxillary Midline Diastemas. Gass J , Valiathan M, Tiwari HK, Hans MG. Abstract number 435. Journal of Dent Res: (80), pg 90, 2001.

Heritability of Head and Facial Form in Caucasian Families. Hans MG, Redline S, Elston R, Nelson K, Russo L, Taylor J and Valiathan M. Abstract number 434. Journal of Dent Res: (80), pg 90, 2001.