Relative Magnitudes of Crown Size Reduction and Body Size Reduction in 47-Trisomy G

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Since crown size reduction has been observed in 47-trisomy G (M. M. COHEN and R. A. WINER, *J Dent Res* **44**:197-208, 1965; M. M. COHEN, S. M. GARN, and M. A. GECIAUSKAS, *J Dent Res* **49**:460, 1970) with delayed tooth formation timing (S. M. GARN, C. W. STIMSON, and A. B. LEWIS, *J Dent Res* **49**:640, 1970), it is useful to compare the magnitude of crown size reduction with the magnitude of body size reduction characteristic of individuals with trisomy G (Down's syndrome) in general.

Mesiodistal crown size data from 74 verified instances of 47-trisomy G (Walter E. Fernald State School, Waverley, Mass, USA) indicate a major reduction in crown size in both the 29 males and 45 females studied (Table). Compared with the standard or reference population (S. M. GARN, A. B. LEWIS, and A. J. WALENGA, *Arch Oral Biol* **13**:841-844, 1968), the systematic reduction in crown size in the individuals with trisomy G is 10% in females and 8% in males. Expressed in standard deviation units or "Z scores," the size reduction approximates 1.35 standard scores for 28 permanent teeth in both sexes. Maximum tooth size reduction was exhibited by the maxillary second molars, lateral incisors, and canines and the pattern of both Z score and percentage size reductions were surprisingly similar in both sexes as revealed by a rank order correlation of 0.83.

In contrast to the 1.35 Z score, 8.7% crown size reduction, relative reduction in stature is considerably greater in individuals with trisomy G at all ages. For 126 subadult 47-trisomy G patients (Plymouth State Home and Training School, Northville, Mich, USA), reduction in stature was 4.0 Z scores and 16.7%, respectively, and for 22 adult Michigan patients the reduction in stature was 4.1 Z scores or 14.6%. Twenty-seven individuals with trisomy G from Massachusetts (uniformly excluding 47/46 mosaics, D/G translocations, and 48-trisomy G XXX individuals) similarly exhibited reduction in stature that was in excess of 3.3 standard deviations.

Crown size reduction in trisomy G, although considerable by ordinary standards, is of less relative magnitude than the reduction in body size (stature), similarly expressed either as standard deviations or Z scores, or as percentage. In this respect the lesser reduction in crown size agrees with other data, indicating a smaller delay in dental development than in skeletal development in a wide variety of endocrinopathies and size diminutions (S. M. GARN, A. B. LEWIS and R. M. BLIZZARD, *J Dent Res* **44**:243-258, 1965).

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RELATIVE SIZE REDUCTION OF PERMANENT TEETH IN 47-TRISOMY G

Tooth	29 Males			45 Females		
	Mean (mm)	Reduction		Mean (mm)	Reduction	
		Z Score	%		Z Score	%
			Maxilla			
I1*	8.42	0.73	4.9	8.00	1.07	6.9
I2	5.80	1.54	13.6	5.47	1.78	17.0
C	7.10	1.96	11.0	6.68	2.16	12.5
P1	6.56	1.23	7.6	6.27	1.52	9.7
P2	6.38	0.91	5.8	5.98	1.43	10.1
M1	10.04	0.18	0.9	9.50	0.69	3.7
M2	8.24	2.90	17.4	7.65	3.34	21.1
			Mandible			
I1	5.42	0.08	0.6	5.25	0.36	2.6
I2	5.65	0.93	6.5	5.53	1.03	6.7
C	6.54	1.18	6.6	6.06	1.44	8.5
P1	6.72	1.06	7.1	6.42	1.39	8.7
P2	6.62	1.40	8.7	6.55	1.08	7.7
M1	10.46	1.50	8.2	10.25	1.09	6.6
M2	9.42	1.87	11.7	9.11	1.86	11.9
Mean reduction		1.25	7.9	...	1.45	9.6

Note disproportionate reduction of M2, I2 and C.
* I1, first incisor; I2, second incisor; C, canine; P1, first premolar; P2, second premolar; M1, first molar; M2, second molar.