Clinical Paper
Congenital Craniofacial Deformities

Study of the cephalometric features of parents of children with cleft lip and/or palate anomaly

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M. Zandi, A. Miresmaeili: Study of the cephalometric features of parents of children with cleft lip and/or palate anomaly. Int. J. Oral Maxillofac. Surg. 2007; 36: 200–206.
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Abstract. The purpose of this retrospective case-control study was to compare the cephalometric features of parents of children with cleft anomalies to those of parents of normal children in the hope of finding potential markers of predisposition for this condition. There were 22 sets of parents of cleft children (study group) and 22 sets of parents of normal children (control group). A total of 88 lateral cephalograms were traced twice by two observers separately and analyzed using Student's *t*-test. Seven linear, two angular and five triangular cephalometric variables were measured. Mandibular body length (Go–Gn) in mothers was larger in the study than the control group, posterior cranial base (S-Ba) in fathers was shorter in the study than the control group, anterior maxillary triangle (S.N.A) in parents in the study group was larger than in the control group and posterior maxillary triangle (S.N.Pns) in study group mothers was larger than in control group mothers. In conclusion, the craniofacial morphology of the parents of children with cleft anomalies differs from that of parents of normal children and may have some predictive value.

Orofacial clefts are one of the most frequently encountered congenital malformations. They are produced by genetic and environmental factors and exhibit an interesting racial predilection, being less frequent in black people and more common in those of Oriental descent. Many studies have shown that identification of the individuals at risk of producing a child with a cleft anomaly using only a genetic approach is very difficult at the present time. The genetic assessment of parents for this risk should be supplemented with craniofacial data analysis[16].

Many investigators have reported that the craniofacial morphology of the parents of children with orofacial clefting differs from that of normal individuals[6–8,13,17–21]. MCINTYRE & MOSSEY in a systematic review of fifteen cephalometric studies investigating the craniofacial morphology of the parents of children with orofacial clefting found that, although the craniofacial morphology of such parents differs from that of the parents of normal children, the data from these studies are conflicting and insufficient to accurately localize these differences, so further studies are required[15].

The objective of this study was to compare the cephalometric features of parents of affected and normal children, and to correlate the results with those of

other investigators, in the hope of finding some cephalometric features that could act as markers of predisposition of parents to have a child with a cleft deformity. Cephalometric analysis could then be used in conjunction with genetic screening to identify 'at-risk' parents.

Materials and method

The subjects of this study were 22 sets of parents (22 mothers and 22 fathers) of children having cleft anomaly (study group) and 22 sets of parents (22 mothers and 22 fathers) of normal children. All parents who participated in this study had no experience of previous surgical and orthodontic treatment, no history of injury to craniofacial structures and no gross skeletal defect. All of them were drawn from Hamedan, one of the 30 provinces of Iran, so ethnic variability of craniofacial morphology was eliminated (the race of the sample studied is Aryan). The mean age of the mothers and fathers in the study and control groups at the time the cephalograms were taken was 30.41, 33.45, 31.04 and 32.85 years, respectively (Table 1).

A total of 88 lateral cephalograms of the study and control groups were traced on acetate paper, twice by two observers separately, with an interval of approximately 40 days between replicate tracings. The intra-observer and inter-observers errors were insignificant for purposes of statistical analysis. Landmarks for lateral cephalograms used in this study are shown in (Fig. 1).

Seven linear, two angular and five triangular lateral cephalometric variables were measured (Table 2). Some of these variables that are not commonly used are as follows: anterior maxillary triangle (S.N.A): a triangle constructed by joining the points S, N and A (Fig. 2); posterior maxillary triangle (S.N.Pns): a triangle constructed by joining the points S, N and Pns (Fig. 3); mandibular triangle (Co.Gn.Go): a triangle constructed by joining the points Co, Gn and Go (Fig. 4); cranial base triangle (S.N.Ba): a triangle constructed by joining the points S, N and Ba (Fig. 5); nasopharyngeal triangle (S.Pns.Ba): a triangle constructed by joining the points S, Pns and Ba (Fig. 6).
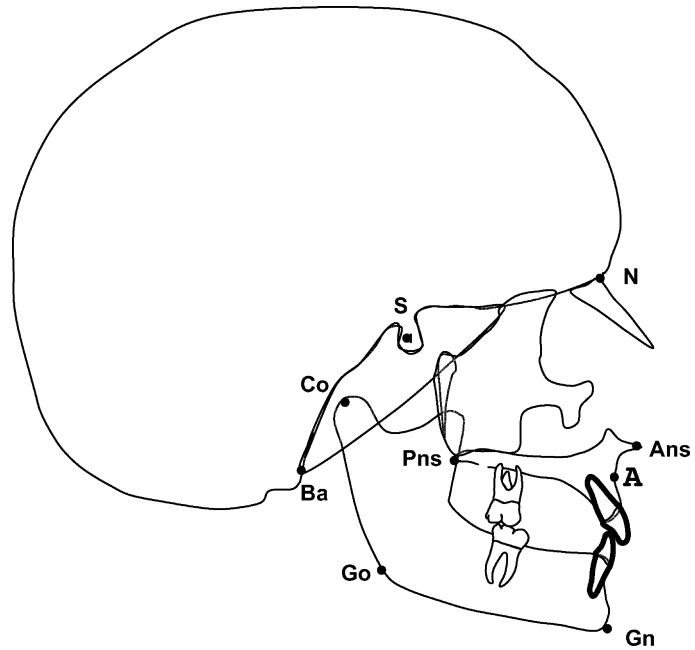

Fig. 1. Landmarks: N,nasion; S,sella; A,subspinale; Ans,anterior nasal spine; Pns,posterior nasal spine; Go,gonion; Gn, gnathion; Co,condylion; Ba,basion.
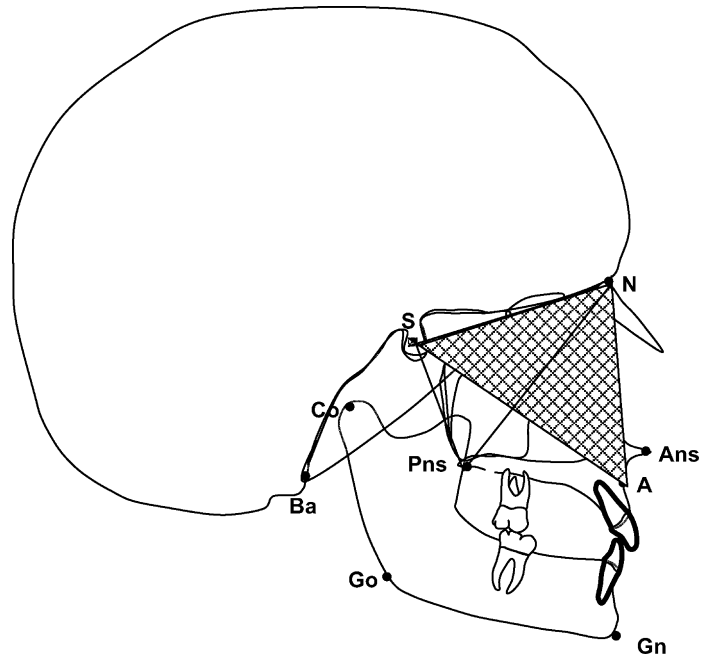

Fig. 2. Anterior maxillary triangle.

With all variables, the mean values obtained for mothers, fathers and parents in the study group were compared with the mean values of their counterparts in the control group. These were subjected to statistical evaluation using Student's *t*-test and the statistically significant differences between the groups evaluated by calculating the *P*-value.

Results

The mean and standard deviation values of the cephalometric variables of the

Table 1. Age of parents in years

	Study group		Control group	
	Fathers	Mothers	Fathers	Mothers
Range	22–48	18–46	23–48	22–46
Mean	33.45	30.41	32.85	31.04