

Changing Maxillary and Mandibular Inter-canine and Inter-molar Distance between 8 to 20 years: Male and Female

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Abstract

The growth and development of the maxillary and mandibular intercanine and intermolar distances are of special interest for anatomist orthodontist, prosthodontist, oral surgeon and forensic scientist. The study was conducted on 210 patients casts, aged between 8-20 years. The intercanine and intermolar width of both arches increase significantly ($p < 0.05$) and sexual dimorphism occur.

INTRODUCTION

The growth and development of the maxillary and mandibular intercanine and intermolar distances are of special interest in medical and forensic practice. Sinclair and Little¹ described a decrease of 0.75 mm in the intercanine dimension, especially for women, in the 13 to 20 year age group. Bishara et al.² found a significant decrease in the upper and lower intercanine dimensions of females above 25 years. In males individuals only the inferior intercanine dimension showed reduction. While evaluating adult dental arch dimension changes, Carter and Mc Namara³ found a reduction in the upper and lower intercanine dimensions.

Regarding the distance between molars, Sillman⁴ did not observe any changes in males aged 14 years and older but showed insignificant reduction for females even after 16 years. Bishara et al.² demonstrated that the upper intermolar distance underwent an increase in adults aged 25 to 45 years, whereas the intermolar distance in mandibular did not undergo the same changes. This paper reviews a change in intercanine and intermolar distance of upper and lower jaw with age.

MATERIAL AND METHODS

The study was conducted on 210 patients (107:103, M:F) in the age groups of 8-20 years, selected from the Out Patient Department of Govt. Dental College associated with Pt. B.D. Sharma Postgraduate Institute of Medical Science, Rohtak (Haryana). The individuals participating in the sample presented dental and skeletal class I occlusion and had a satisfactory clinical occlusion. Thus, they represented

normal occlusion cases and not excellent or ideal occlusion. The impression of both arches were taken with alginate and poured with type IV dental stone. Care was taken to pour the impression immediately to minimize any dimensional change. The intercanine and intermolar distance of maxillary and mandibular were measured with vernier calliper on the casts.

RESULTS

Figure 1

Table 1 : The mean and Standard Deviation of Inter-canine and intermolar distance of 210 (M:F :: 107:103) patients aged 8-20 years.

Age groups	Inter-canine distance (in mm) (Mean + S.D.)				Inter-molar distance (in mm) (Mean + S.D.)			
	Maxillary		Mandibular		Maxillary		Mandibular	
	Male	Female	Male	Female	Male	Female	Male	Female
8-11	21.1±0.23	19.8±0.09	20.5±0.32	19.3±0.42	34.5±0.42	33.2±0.42	32.7±0.49	32.9±0.42
11.1-13	22.5±0.34	21.7±0.49	21.9±0.39	19.9±0.47	35.6±0.39	34.4±0.42	33.9±0.42	33.9±0.49
13.1-15	23.7±0.42	22.7±0.43	22.8±0.23	21.9±0.47	36.7±0.42	35.2±0.38	34.7±0.49	34.9±0.48
15.1-17	24.9±0.32	23.9±0.34	23.7±0.42	23.1±0.43	37.9±0.49	36.9±0.32	36.8±0.47	35.8±0.42
17.1-19	25.9±0.32	24.9±0.32	24.0±0.32	24.1±0.47	38.9±0.38	37.9±0.32	37.2±0.29	36.2±0.59
19.1-20	25.9±0.07	25.1±0.06	24.1±0.02	24.3±0.08	38.9±0.02	37.9±0.02	37.8±0.07	36.9±0.09

The values for intercanine and intermolar of the maxillary

and mandibular showed a statistically significant increase till 8 to 19 years ($p < 0.05$). The mandibular intercanine widths showed a significant increase after 19 years ($p < 0.05$). Sexual dimorphism was observed in changes in intercanine and intermolar distance ($p < 0.05$) of arches.

DISCUSSION

In the upper and lower arches intercanine widths show significant change in evaluated the sample ($p < 0.05$) while Sinclair and Little ¹ have stated that there are significant changes in their factor because they reported a 0.75 mm decrease in the intercanine distance, especially for females, aged between 13 to 20 years. Bishara et al. ² verified a reduction of 0.4 and 0.6 mm in the upper and lower intercanine widths respectively, but only after 25 years. Likewise Carter and Mc Namara ³ found a decrease of 0.65 and 0.58 mm in the upper and lower intercanine distances respectively, when they evaluated adult individuals.

Significant change was observed for maxillary arch (till 19 year) $p < 0.05$ while constant values for upper and lower intermolar widths have also been found after 14 years. ⁴ Bishara et al. ² demonstrated a mean increase of 0.2 mm in the upper intermolar width, but they were observing individuals between 25 and 45 years, which could be a reflection of the predisposition for this age group.

CONCLUSION

After the changes in Inter-canine and intermolar distance of 210 individuals aged 8 to 20 years with normal occlusion had been evaluated, it could be concluded that

- A significant increase in Maxillary and Mandibular Inter-canine and inter molar widths.
- Variables showed significant dimorphism

Hence the value would be of help for orthodontist, oral surgeon for number of procedures like arch expansion, cleft palate cases, rapid maxillary expansion etc. These values may be helpful in forensic science and for anatomist for growth determination, sexual dimorphism and identification.

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