A new proposed regression equation for mixed dentition analysis using the sum of permanent mandibular four incisors and first molar as a predictor of width of unerupted canine and premolars in a sample of North Indian population

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ABSTRACT

**Objective:** The objective of this study was to establish a new regression equation for North Indian and to compare and correlate the predicted width of unerupted canine and premolars obtained from the proposed regression equation of the present study in the North Indian population sample, Moyer’s prediction table and also from Melgaco regression equation with the actual width; in order to check the applicability of various methods of mixed dentition analysis for the North Indian population.

**Materials and Methods:** The sample consisted of 200 dental casts obtained from the North Indian patients and students which consists of 100 males and 100 females with the average age of 20.12 ± 4.70 years for males and 19.54 ± 3.16 years for females. Mesiodistal tooth widths of mandibular arch from permanent right first molar to left first molar were measured with an electronic digital caliper. Student t-test was used for comparison and Pearson's correlation coefficient was used to correlate the actual sum and the predicted width of the permanent mandibular canines and premolars obtained from various methods.

**Results:** The difference between the actual and predicted width was statistically insignificant using the regression equation obtained for the North Indian sample population (correlation $r = 0.78$) in contrast to the significant difference with predicted width obtained from Melgaco equation ($r = 0.61$) and Moyer’s prediction table ($r = 0.42$).

**Conclusions:** A new proposed regression equation for the North Indian population was established.

Amongst the three regression equations devised, the proposed regression equation formulated in the present study; gave the most accurate results confirming racial variation in tooth size. This method is considered as an easy and practical way to predict the size of unerupted canines and premolars.

**Key words:** Mixed dentition analysis, prediction, regression equation, unerupted canine and premolars

INTRODUCTION AND REVIEW OF LITERATURE

Space analysis in the mixed dentition is an important aspect of orthodontic diagnosis and treatment planning. Considering this, the reliable estimation of the size of unerupted canines and premolars (SCPM) during the mixed dentition is essential for early perception and consequent interception of potential malocclusion in order to ensure proper growth and facial development.$^{[1,2]}$ Mixed dentition analysis (MDA) helps in determining whether the treatment plan will include serial extractions, guidance of eruption, space maintenance, space regaining, or just periodic observation of the patient.$^{[3]}$

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Access this article online

Quick Response Code:

Website: www.jorthodsci.org

DOI: 10.4103/2278-0203.123199

Journal of Orthodontic Science  ▪ Vol. 2  ▪ Issue 4  ▪ Oct-Dec 2013
The concept of dental space analysis to predict the width of unerupted permanent canines and premolars can be categorized into four basic methods i.e., measurements of unerupted tooth on periapical radiographs or 45° cephalometric radiographs,[4-5] calculations from prediction equations and tables,[6-8] combination of radiographic measurements and prediction tables[9-11] and regression equation method.[6] The radiographic method had a drawback in terms of magnification errors, whereas prediction equation and table tend to overestimate or underestimate the size of unerupted canine and premolars. The regression equation is given by the formula $Y = a + bX$ that establishes a mathematical relation between variables thereby making it relatively an accurate method.

Several linear regression equations have been proposed and published for populations of different ethnic origins with MDA varying among different racial and population groups.[12,13] Further, sexual dimorphism and racial variation has been confirmed in several studies as the tooth size is greater in males than females.[12,14-16]

To formulate a regression equation, different combinations of erupted teeth have been used previously to predict the width of unerupted canine and premolars.[12,14-17] Amongst these; is the combination of the sum of permanent mandibular four incisors and first molars of both sides (sum of incisors and molars [SIM]). This combination gave the highest correlation with the actual width. Hence, it was decided to use the above mentioned combination in North Indian population sample which was also used in the past studies.[16,18-20] However, before applying this method, it was planned firstly to apply the commonly used Moyer’s prediction table for our population.

Until date, no data had been published to predict the width of unerupted permanent canine and premolars for North Indian population; hence, the aims of the present study were to establish a regression equations separately for North Indian males and females subjects and to compare and correlate the predicted values obtained from the Moyer’s prediction table, from the regression equation established in the present study and from the regression equation formulated for the Brazilian population by Melgaço,[16] to the actual width of canine and premolars. This is, in order to check the applicability of the various methods of dental space analysis for North Indian population.

**MATERIALS AND METHODS**

**Sample**

The sample of the present study was comprised of dental casts of 200 subjects (100 males, 100 females) chosen from the patients visiting the out-patient dental clinic of the dental college; students of other institutes in the same university in addition to students from various states of North India region.

**Criteria of Selection**

1. All subjects were natives of North Indian region (at least two generations of the subjects selected belonged to various states of North India i.e. Uttar Pradesh, Uttarakhand, Delhi, Punjab, Haryana, Rajasthan, Bihar),
2. Having Angle’s class I molar and canine relationship,
3. Free from caries and interproximal restorations and
4. Having fully erupted mandibular incisors, canines, premolars and first permanent molar.

**Impression and Data Recording**

The standard protocol for recording impression was followed and dental casts of high quality, free from distortion, were obtained with dental stone (Type III). For accuracy of measurement, a digital vernier caliper (Aerospace Co.) with a calibrated digital micrometer, which read to the nearest 0.01 mm, was used to record the mesiodistal dimensions of the mandibular teeth [Figure 1]. The caliper was inserted from the buccal or labial embrasure area with the instrument held parallel to the occlusal surface and perpendicular to the long axis of the tooth. The mesiodistal widths of mandibular permanent teeth from the first molar in the right side to the first molar in the left side were measured. This was done in order to obtain the sum of incisors and first molars of both sides ([SIM]), sum of all incisors [SI] and sum of canine and premolars [SCPM] of the right side and left side).

SI was used to predict the width of SCPM of one side from Moyer’s probability chart at 75% and compared and correlated to the averaged actual value of SCPM.

SIM on X line and actual SCPM of both sides on Y line were plotted and a linear trend line was passed on this X-Y scatter which gives the regression equation on the graph for the North Indian population as $Y = a + bX$ where $X$ (SIM) is the independent variable and $Y$ (predicted SCPM) is the dependent variable.

Separate regression equation was formulated for males (Group I), females (Group II) and for both sexes combined (Group III). On substituting the value of $X$, total predicted SCPM value (right and left sides) was obtained as $Y$ for the North Indian population sample.

![Figure 1: Measuring mesiodistal width using electronic digital calipers](journal-of-orthodontic-science-vol-2-issue-4-oct-dec-2013-125)
Similarly; SIM of the present study population sample was substituted in Melgaco regression equation to obtain SCPM using their equation. The total actual SCPM (right and left sides) were compared and correlated to the total predicted SCPM (right and left sides) obtained by the two different regression equation devised for the present study population sample and the Brazilian population respectively.

**Statistical Analysis**

All analyses were performed on SPSS (SPSS Inc. Released 2009. PASW Statistics for Windows, Version 18.0. Chicago: SPSS Inc) software. Data were summarized as Mean ± standard deviation (SD) paired observations were compared by paired t-test (α =2) while independent groups were compared by independent Student’s t-test. Pearson’s correlation was done to assess the association between the variables. A simple linear regression was used to assess relative association between the variables considering SIM the independent variable (X) and the actual SCPM as the dependent variable (Y). The level of significance was at P < 0.05.

**Error of the Measurement**

The measurements of randomly selected 30 study casts were repeated twice with 1 week interval by one investigator. All the measurements were recorded on Microsoft Excel (2007) spread sheet. Student t-test was carried out to compare the difference between the two measurements. Statistically insignificant differences were observed.

**RESULTS**

Table 1 shows the distribution and means age of different groups participated in the present study.

Table 2 shows mean values of SI, SIM, average SCPM (actual), total SCPM.

Table 3 shows the comparison between the actual and predicted width obtained from Moyer’s probability chart.

Table 4 shows the regression equation devised for Group I, Group II and Group III for the North Indian population is as follows.

- Y = 7.70 + 0.7386X for Group I (males)
- Y = 13.00 + 0.6065X for Group II (females)
- Y = 7.15 + 0.7450X for Group III (males + females).

Table 5 shows comparison of actual SCPM and predicted SCPM width obtained from the present study regression equation and Melgaco regression equation.

Table 6 shows the strength of estimations or predictions by the present study regression equation, Melgaco equation and prediction from Moyer’s probability table to the actual SCPM for Group I, Group II and Group III.

Table 7 exhibits mean the difference between actual and predicted SCPM in the present study and other studies by Moyers probability chart.

Table 8 demonstrates mean difference between actual and predicted SCPM in the present study and the other studies using the same combination i.e. sum of incisors and mandibular first molars to formulate regression equation.

The scatter plots of the data show the presence of outlying values, the linearity of the relationship around the regression line. The correlation values between actual and predicted SCPM obtained in the present study for Group I, Group II and Group III were presented in Figures 2-4 respectively.

**DISCUSSION**

Among the population of various racial and ethnic origins, as well as different sexes, mesiodistal tooth dimensions and craniofacial characteristics differ.[15-18] Sexual dimorphism was
Tikku, et al.: Regression equation for North Indian population

Journal of Orthodontic Science

Vol. 2  |  Issue 4  |  Oct-Dec 2013

for maxillary arch and 0.77 for mandibular arch) followed by
the sum of upper centrals and lower first molars ($r = 0.72$
for maxillary and 0.74 for mandibular arch) and least for the
sum of upper central incisors ($r = 0.61$ and $r = 0.62$). Considering
this, the SIM was used to formulate regression equation in
the past studies;\[16,18-20]\ it was also decided to be used in the
present study to formulate a regression equation for North
Indian population sample.

Considering racial variation of various methods of MDA was
formulated for a particular race might not be applicable for
another race. Hence, in the first part of the present study, it
was decided to confirm the applicability and effectiveness of
Moyer’s prediction table for the North Indian sample population
with that established for the North European descent. The
results of the present study showed that the mean difference
between the average actual and the predicted SCPM values
obtained from Moyer’s table were found to be statistically
significant ($P < 0.001$) for the three groups. This finding was
similar to previous reported studies wherein Moyer’s prediction
table was used for their population\[12,21,22]\ [Table 7]. In contrast
to this, there were few studies wherein Moyer’s method was
found to be applicable at different percentile levels, but they
did not compare the statistical difference between the actual
and predicted SCPM at that percentiles.\[14,23,24]\ As Moyer’s method is not applicable for the North Indian
population therefore, it was decided to formulate a regression
equation separately for males and females for the North Indian
population. For formulating a regression equation; different
combinations of teeth have been used in the past. Using a
combination of the sum of incisors; statistically significant
difference was observed between the actual and the predicted
SCPM in the studies carried out by Jaroontham and Godfrey\[25]\ Bherwani and Fida\[26]\ and Ahluwalia \textit{et al}..\[27]\ Based on these
studies, it can be stated that using the sum of the lower incisors
alone was not the best predictor for calculating the width of
unerupted canine and premolars.

When comparing the predicted width obtained from the present
study regression equation with the actual SCPM of the North
Indian population sample, statistically insignificant difference
was found ($P > 0.05$). This finding was also corroborated in
various studies.\[16,18-20]\ This result suggests that regression
equation formulated using SIM fulfils the requirement of
obtaining an accurate prediction method wherein, statistically
insignificant difference should exist between actual width and
the predicted width [Table 8].

| Groups | Regression equation | Regression constants |
|--------|---------------------|----------------------|
|        | Intercept (a)  | Slope (b)  |
| I      | Y=7.70+0.7386X  | 7.70  | 0.7386 |
| II     | Y=13.00+0.6065X | 13.00 | 0.6065 |
| III    | Y=7.15+0.7450X  | 7.15  | 0.7450 |

Where ”X” is SIM (independent variable) and ”Y” is predicted SCPM of both the
sides (dependent variable). SCPM – Size of unerupted canines and premolars.

Table 4: Comparison of average SCPM to predicted SCPM obtained from Moyer’s probability chart

| Groups | Actual SCPM | Predicted (Moyer’s) SCPM | Difference (actual-predicted) SCPM | $t$ value | $P$ value |
|--------|-------------|--------------------------|------------------------------------|----------|----------|
| I      | 20.39±1.11  | 21.15±1.23               | 0.76±1.01                          | 15.08    | <0.001†  |
| II     | 19.44±1.13  | 20.72±1.16               | 1.28±1.41                          | 24.17    | <0.001†  |
| III    | 19.91±1.21  | 21.31±1.27               | 1.40±1.38                          | 25.22    | <0.001†  |

* $P>0.05$ – Not significant; $P<0.05$ – Significant; † $P<0.001$ – Highly significant; SCPM – Size of unerupted canines and premolars; SIM – Sum of incisors and molars.

Figure 3: Correlation between actual and predicted size of unerupted canines and premolars in Group II

Figure 4: Correlation between actual and predicted size of unerupted canines and premolars in Group III

also confirmed in the present study; where the mean SI, SIM
and SCPM showed statistically significant difference between
males and females.

Nourallah \textit{et al}.\[17\] used different combinations of teeth and
found the highest correlation when he used SIM ($r = 0.78$
Table 5: Comparison of total actual SCPM to predicted SCPM obtained for present study regression equation and Melgaco’s regression equation

| Groups | Difference (actual-predicted) SCPM (North Indian sample regression) mean (in mm) | t value | P value* (NS) | Difference (actual-predicted) SCPM* Melgaco’s equation mean (in mm) | t value | P value |
|--------|---------------------------------------------------------------------------------|---------|----------------|---------------------------------------------------------------------|---------|---------|
| I      | 0.13±0.88*                                                                      | 0.003   | >0.05          | 3.17±1.21                                                          | 21.51   | <0.001* |
| II     | 0.16±0.91*                                                                      | 0.853   | >0.05          | 2.15±1.15                                                          | 17.39   | <0.001* |
| III    | 0.15±0.97*                                                                      | 0.228   | >0.05          | 2.13±1.19                                                          | 16.47   | <0.001* |

*P<0.05 – Not significant; †P<0.001 – Highly significant; SCPM – Size of unerupted canines and premolars

Table 6: Correlation of actual SCPM with predicted SCPM obtained by three different methods for various groups

| Groups | Studies | Correlation (r value) | Coefficient of determination (r² value) |
|--------|---------|-----------------------|----------------------------------------|
| I      | Present R.E | 0.78                  | 0.60                                   |
|        | Melgaco R.E | 0.70                  | 0.49                                   |
|        | Moyer’s table | 0.46                  | 0.21                                   |
| II     | Present R.E | 0.74                  | 0.55                                   |
|        | Melgaco R.E | 0.61                  | 0.37                                   |
|        | Moyer’s table | 0.49                  | 0.24                                   |
| III    | Present R.E | 0.78                  | 0.61                                   |
|        | Melgaco R.E | 0.72                  | 0.52                                   |
|        | Moyer’s table | 0.42                  | 0.18                                   |

SCPM – Size of unerupted canines and premolars, R.E – Regression equation

Table 7: Mean difference between actual and predicted SCPM in present study and other studies by Moyer’s probability chart

| Studies                  | Difference (actual-predicted) SCPM mean (in mm) |
|--------------------------|-----------------------------------------------|
|                          | Group I (males)                               | Group II (females)                           |
| Present study            | 0.76*                                         | 1.28*                                         |
| Schirmer and Wiltshire    | 1.15*                                         | 0.64*                                         |
| Mahmoud et al. study     | 0.49*                                         | 0.91*                                         |
| Hammad and Abdellatif    | 0.55*                                         | 0.824*                                        |

*P<0.05 – Not significant; †P<0.001 – Highly significant; SCPM – Size of unerupted canines and premolars

Table 8: Mean difference between actual and predicted SCPM in the present study and the other studies

| Studies                  | Difference (actual-predicted) SCPM mean (in mm) |
|--------------------------|-----------------------------------------------|
|                          | Group I (males)                               | Group II (females)                           | Group III (males+females) |
| Present study            | 0.13±0.88*                                    | 0.16±0.91*                                   | 0.15±0.97*                |
| Melgaço study[14]        | 0.02±1.49*                                    | 0.04±1.36*                                   | 0.00±1.44*                |
| Mittar et al. study[19]  | 0.01±1.59*                                    | 0.005±1.54*                                  | 0.007±1.52*               |
| Jaju et al. study[18]    | 0.02±1.62*                                    | 0.55±1.62*                                   | -                         |
| Memon and Fida study[20] | 0.02±0.30*                                    | 0.01±0.39*                                   | -                         |

*P<0.05 – Not significant; †P<0.001 – Highly significant; SCPM – Size of unerupted canines and premolars

Further, racial variation was confirmed when predicted width of SCPM obtained by substituting values of SIM of the North Indian population in Melgaco regression equation showed statistically significant difference with actual SCPM [Table 5]. Furthermore, sexual dimorphism was also confirmed in the present study [Table 6].

The strength of estimation in predicting SCPM was tested by correlation method. Table 6 shows that the highest correlation was found when using the present study regression equation followed by Melgaco regression equation and the least by Moyer’s method. Variations in the results among different studies might be attributable to different sample sizes, methods of analysis, ethnic groups and/or SDs.[28]

To summarize the finding of the present study, it can be stated with caution that the regression equation formulated specifically for the North Indian population sample (using SIM) was by far considered to be one of the best methods of prediction amongst different methods evaluated. However, the Hixon-Oldfather, approach was considered to be the most accurate, but it is complex and many find it difficult to use.[29-31]

These linear regression equations formulated for the North Indian population may be easy to use with no requirements of software or specific equipment for MDA. Accurate prediction of SCPM will definitely help in judging whether the space in the posterior segment is sufficient to allow the permanent teeth to erupt freely with good alignment. Based on this regression equation, prediction tables at varying values of SIM can be formulated for the North Indian population which making it simpler and easy to use. However, in future studies; regression equation should be devised for maxillary arch as well. Furthermore, the present study regression equation should be tested in a large and representative sample to confirm its predictive accuracy and consistency.

Finally, the formulation of these equations should be more beneficial for the orthodontists to establish proper diagnosis and treatment planning during the critical period of the mixed dentition stage.

**CONCLUSIONS**

1. The proposed regression prediction equation (using SIM) formulated for the North Indian population is as follows:
   - \( Y = 7.70 + 0.7386X \) for Group I (males).
Y = 13.00 + 0.6065X for Group II (females).
Y = 7.15 + 0.7450X for Group III (males + females).

2. Statistically significant difference was found when Moyer’s probability table was used considering it to be inapplicable for the North Indian population.
3. Statistically insignificant difference was observed between the actual and predicted SCPM using the present study regression equation considering it as one of the most accurate method among other methods.
4. Significant difference was found when Melgaco regression equation was used, thereby confirming racial variation. Hence, using or establishing a regression equation formulated for a particular population proves to be the most accurate method of MDA.
5. The correlation and determination coefficients found in the present study regression equation were the highest, followed by Melgaco regression equation and the least in Moyer’s probability chart.

REFERENCES

1. Diagne F, Diop-Ba K, Ngom Pj, Mbrow K. Mixed dentition analysis in a Senegalese population: Elaboration of prediction tables. Am J Orthod Dentofacial Orthop 2003;124:178-83.
2. Profitt WR, Fields HW. Contemporary Orthodontics. 4th ed. St. Louis: Mosby Inc.; 2000. p. 195-200.
3. Uysal T, Basciftci FA, Goyenc Y. New regression equations for mixed-dentition arch analysis in a Turkish sample with no Bolton tooth-size discrepancy. Am J Orthod Dentofacial Orthop 2009;135:343-8.
4. de Paula S, Almeida MA, Lee PC. Prediction of mesiodistal diameter of unerupted lower canines and premolars using 45 degrees cephalometric radiography. Am J Orthod Dentofacial Orthop 1995;107:309-14.
5. Staley RN, Shelly TH, Martin JF. Prediction of lower canine and premolar widths in the mixed dentition. Am J Orthod 1979;76:300-9.
6. Ferguson FS, Macko DJ, Sonnenberg EM, Shakun ML. The use of regression constants in estimating tooth size in a Negro population. Am J Orthod 1978;73:68-79.
7. Meyers RE. Handbook of Orthodontics. 4th ed. Chicago: Yearbook Medical Publishers; 1988. p. 235-40.
8. Tanaka MM, Johnston LE. The prediction of the size of unerupted canines and premolars in a contemporary orthodontic population. J Am Dent Assoc 1974;88:798-801.
9. Bishara SE, Staley RN. Mixed-dentition mandibular arch length analysis: A step-by-step approach using the revised Hixon-Oldfather prediction method. Am J Orthod 1984;86:130-5.
10. Staley RN, Hoag JF. Prediction of the mesiodistal widths of maxillary permanent canines and premolars. Am J Orthod 1978;73:169-77.
11. Staley RN, Kerber PE. A revision of the Hixon and Oldfather mixed-dentition prediction method. Am J Orthod 1980;78:296-302.
12. Schirmer UR, Wiltshire WA. Orthodontic probability tables for black patients of African descent: Mixed dentition analysis. Am J Orthod Dentofacial Orthop 1997;112:545-51.
13. Yuen Kk, Tang EL, So LL. Mixed dentition analysis for Hong Kong Chinese. Angle Orthod 1998;68:21-8.
14. Bernabé E, Flores-Mir C. Are the lower incisors the best predictors for the unerupted canine and premolars sums? An analysis of a Peruvian sample. Angle Orthod 2005;75:202-7.
15. Legović M, Novosel A, Legović A. Regression equations for determining mesiodistal crown diameters of canines and premolars. Angle Orthod 2003;73:314-8.
16. Melgaco CA, da Sousa Araujo MT, de Oliveira Ruellas AC. Mandibular permanent first molar and incisor width as predictor of mandibular canine and premolar width. Am J Orthod Dentofacial Orthop 2007;132:340-5.
17. Nourallah AW, Gesch D, Khordaji MN, Spieheli C. New regression equations for predicting the size of unerupted canines and premolars in a contemporary population. Angle Orthod 2002;72:216-21.
18. Jaju KR, Guve ND, Chitko SS. A new equation for predicting the width of unerupted permanent canines and premolars for cosmopolitan Indian population. J Indian Orthod Soc 2010;2:83-8.
19. Mittar M, Dua VS, Wilson S. Reliability of permanent mandibular first molars and incisors widths as predictor for the width of permanent mandibular and maxillary canines and premolars. Contemp Clin Dent 2012;3:58-12.
20. Memon S, Fida M. Development of a prediction equation for the estimation of mandibular canine and premolar widths from mandibular first permanent molar and incisor widths. Eur J Orthod 2012;34:304-4.
21. Mahmoud BK, Abu Asab SH, Taib H. Accuracy of four tooth size prediction methods on Malay population. ISRN Dent 2012;2012:523703.
22. Hammad SM, Abdellatif AM. Mixed dentition space analysis in Egyptian children. Pediatr Dent J 2010;20:115-21.
23. Buwembo W, Kutesa A, Muwazi L, Rwemiyeyi CM. Prediction of width of un-erupted incisors, canines and premolars in a Ugandan population: A cross sectional study. BMC Oral Health 2012;12:23.
24. Chanda N, Gupta A, Pradhan KL, Gupta R. Prediction of the size of unerupted canines and premolars in a north Indian Population-An in vitro study. J Indian Dent Assoc 2011;5:329-33.
25. Jaroontham J, Godfrey K. Mixed dentition space analysis in a Thai population. Eur J Orthod 2000;22:127-34.
26. Bherwani AK, Fida M. Development of a prediction equation for the mixed dentition in a Pakistani sample. Am J Orthod Dentofacial Orthop 2011;140:626-32.
27. Ahluwalia P, Jodhka S, Thomas AM. Prediction of mesiodistal width of canines and premolars in a sample of North Indian population. Indian J Dent Advancement 2011;3:568-71.
28. Al-Khateeb SN, Abu Alhaija ES. Tooth size discrepancies and arch parameters among different malocclusions in a Jordanian sample. Angle Orthod 2006;76:459-65.
29. Hixon EH, Oldfather RE. Estimation of the size of unerupted cuspid and bicuspid teeth. Angle Orthod 1958;28:236-40.
30. Gardner RB. A comparison of four methods of predicting arch length. Am J Orthod 1979;75:387-98.
31. Irwin RD, Herold JS, Richardson A. Mixed dentition analysis: A review of methods and their accuracy. Int J Paediatr Dent 1995;5:137-42.

How to cite this article: Tikku T, Khanna R, Sachan K, Agarwal A, Srivastava K, Yadav P. A new proposed regression equation for mixed dentition analysis using the sum of permanent mandibular four incisors and first molar as a predictor of width of unerupted canine and premolars in a sample of North Indian population. J Orthodont Sci 2013;2:124-9.

Source of Support: Nil, Conflict of Interest: None declared.