FACIAL MORPHOLOGY AND MALOCCLUSION IS THERE ANY RELATION? A CEPHALOMETRIC ANALYSIS IN HAZARIBAG POPULATION

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ABSTRACT

Introduction: Dentofacial disfigurement and its relation to facial morphology, with specific attention to self-image, personality, social acceptance, and behaviour. The ability to predict the magnitude and direction of a patient's facial growth early in life would enable the clinician to identify those who require interceptive growth modification and to ensure that the appropriate treatment can be rendered while growth is possible.

AIM OF STUDY

The aim of this study to correlate facial morphology and malocclusion in Hazaribag population.

MATERIALS AND METHOD

58 (30 female and 28 male) Subjects for the present study will be selected randomly from patient treated in Department of Orthodontics and Dentofacial Orthopedics, Hazaribag College of Dental Sciences and Hospital, Demotand, Hazaribag Jharkhand.

1. Professor and Head of Department.
2,6. Second year Post graduate student,
3,4. Reader,
5. Senior lecturer
7,8. First year Post graduate student Hazaribag College of Dental Sciences and Hospital Hazaribag.

RESULTS

Among the 58 subjects, 36 subjects were diagnosed with Angle Class I, 16 are Class II Division 1, 4 are Class II Division 2 and 2 are class III respectively. Hyper divergent pattern group to be smallest (10.3%) with the neutral and hypodivergent patterns are 17.2 and 72.4 % show the distribution of malocclusion among morphological patterns.

CONCLUSION

This study examines associations between facial morphology and malocclusion, and found mean values of all linear measurements in males are larger than female. Relatively strong correlations are found between lower gonial angle, gonial angle, mandibular plane angle, palatal /mandibular plane angle, Frankfurt/ mandibular plane angle SNB, Y Axis , sum of saddle + articular + gonial angles and posterior facial Height.

KEY WORDS

Facial morphology, Malocclusion

INTRODUCTION

Man's face and dentition serve as a mirror of expression and emotion, an instrument of speech and communication as well as in the vital functions of breathing, mastication, and swallowing. Dentofacial disfigurement and its relation to facial morphology, with specific attention to self-image, personality, social acceptance, and behavior.(9) The ability to predict the magnitude and direction of a patient's facial growth early in life would enable the clinician to identify those who require interceptive growth modification and to ensure that the appropriate treatment can be rendered while growth is possible. In addition, the ability to predict facial growth might enable the clinician to forego unneccary treatment on patients with skeletal discrepancies whose growth pattern would probably lead to correction without orthopedic intervention. Similarly, lengthy attempt at orthopedic correction could be avoided in patients who ultimately would be best treated by surgery.(27) In orthodontics, the assessment of facial morphology differs from other medical areas, especially by taking as reference the facial profile or side view, rather than the front view of the face. Therefore, the face width is not considered in most classification systems.(36)

This trend can be understood in light of the importance of radiographic cephalometry in modern orthodontics, with the prevalence of analyses based on lateral Cephalometric radiographies.(37) Malocclusion can be defined as "A condition in which there is a deflection from the normal relation of the teeth to other teeth in the same arch and/

or to teeth in the opposing arch". (31) Patients with deformities may be physically, socially, or mentally challenged and comprise more marked oral health related problems, either because of their authentic disability or because of associated medical conditions. (32) Malocclusion is irregularity which leads to disfigurement hampering the function of teeth, and this disfigurement or imperfection is likely to be an impediment to the patient's physical or emotional comfort. (33) Malocclusion compromises the health of oral cavity and also can lead to social problems to affected patients.(34)

The purpose of the present study was to seek possible identifiable associations between the different Angle types of malocclusion and facial morphology as it is identified with hyperdivergent, neutral and hypodivergent facial patterns in Hazaribag population.

MATERIALS AND METHOD

58 (30 female and 28 male) Subjects(Table 1) for the present study will be selected randomly from patient treated in Department of Orthodontics Hazaribag College of Dental Sciences and Hospital, Demotand, Hazaribag. Method: Radiographic method. All lateral Cephalometric radiographs will be taken by the same operator with the subject standing in, with the head in natural position. The natural head position will be determined by asking the patient to stand relax to look into image of his/her own eyes in vertical mirror fixed on the wall at a constant distance.

Facial morphology has categorized on the basis of three distinct patterns defined by Jarabak Facial Height Ratio (FHR) or Jarabak quotient. This is the ratio of posterior facial height to anterior facial height (S- Goc /N- Me). These patterns (fig 1,2 and 3) are commonly associated with rotational growth changes that tend to accentuate the patern characteristics with growth, so even static evaluations are identifed in terms of growth described in table 2.

The overlap of the circle represents what jarabak calls the gray zones, where it is difficult to predict which direction future growth will carry the face. Generally males in either of these gray zone tend to become more prognathic, while females become more retrognathic or remain the same.

TRACING METHOD

The procedure, followed uniformaly for the entire samples, is describe below. Each cephalogram was traced by the same operator, on acetate tracing paper with 0.5 mm lead pencil. Each cephalogram was traced in the following order to outline, Softtissue profile Cranial base, internal border of cranium, frontal sinus and ear rods.Maxilla and related structures including the nasal bone, pterygomaxillary fissure,lateralorbitalmargins,infra orbital ridges, 1st molars and incisors. Mandible including first molars and incisors.

TABLE 1 : Sample Distribution

Malocclusion	Sex		Total
	F	M	
Class 1	16	20	36
Class II DIV 1	10	6	16
CLASS II DIV 2	3	1	4
CLASS III	1	1	2
Total	30	28	58

TABLE 2 : Characteristics of Facial Pattern

Facial pattern	FHR	Feature
Hyperdivergent growth pattern	< 59%	Face rotating downward and posteriorly with growth. Anterior facial height increases more rapidly than posterior height, and Downs's Y axis and some other angles tends to open.
Neutral growth pattern	59% to 63%	Growth direction is downward and forward along Downs's Y axis , with about the same increments anteriorly and posteriorly, no progressive change in most angular relationship
Hypodivergent growth pattern	>63%	Predominant horizontal growth

STATISTICAL RESULT

Means and standard deviations were supplemented by coefficient of correlation r between FHR and other Cephalometric variables. A value of r <0.2 – slight correlation; negligible relationship, r = 0.2-0.4 – low correlation; weak relationship r = 0.4-0.7 – Moderate correlation; substantial relationship r =0.7- 0.9 – High correlation; marked relationship Facial height values and ratios are shown in table 6

Among the 58 subjects, 36 subjects were diagnosed with Angle Class I, 16 are Class II Division 1, 4 are Class II Division 2 and 2 are class III.

Hyper divergent pattern group to be smallest (10.3%) with the neutral and hypodivergent patterns are 17.2 and 72.4 % show the distribution of malocclusion among morphological patterns. Correlations of FHR ratio with other variables are shown in Table 8.

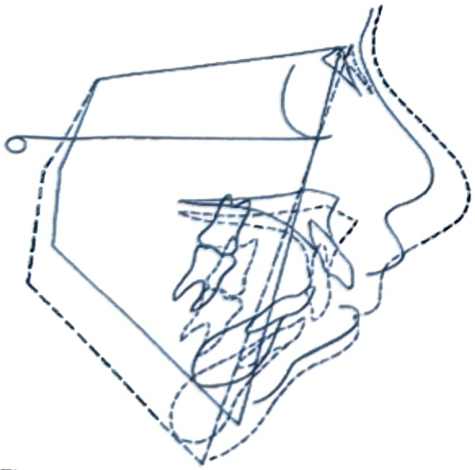

Fig 1: Facial morphology with posterior growth rotation (hyperdivergence)

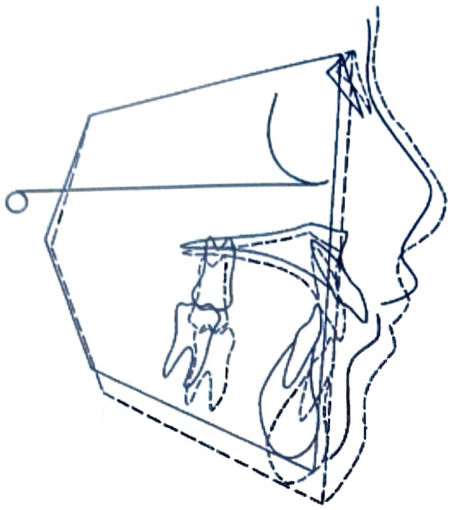

Fig 2: Facial morphology with neutral growth pattern

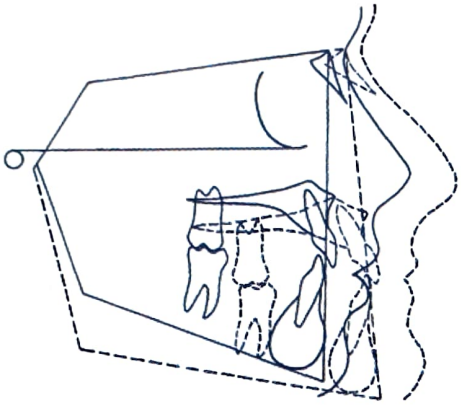

Fig 3: facial morphology with anterior growth rotation (hypodivergence)

DISCUSSION

Angle Class I and Class II Division 1 malocclusion is dominated malocclusion.

Angle Class I malocclusion 11.1 % demonstrate hyperdivergent 16.7 % neutral and 72.2% hypodivergence.

For Class II Division 1 malocclusion 12.5% were hyperdivergent, 25 % neutral and 62.5 % hypodivergent

Class II Division 2 and Class III both show 100 % hypodivergent pattern of growth.

Hypodivergent malocclusion is dominated in both male and female +sample.

CONCLUSION

This study examined associations between facial morphology and malocclusion.

Hypodivergent growth pattern was dominant in Class II Division 2 and Class III malocclusion.

Mean values of all linear

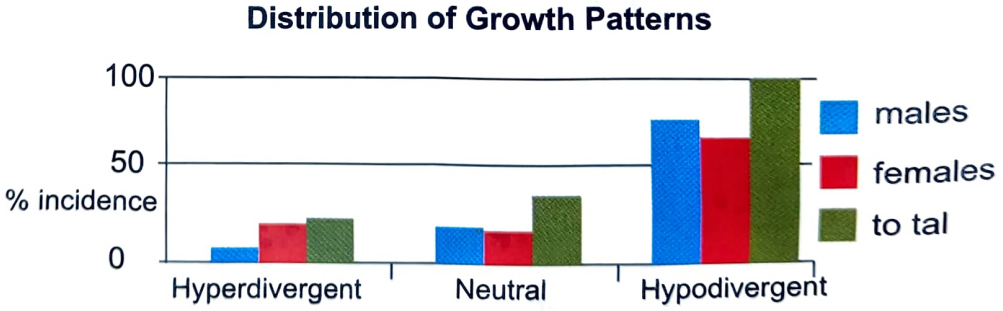

Fig 4: Distribution of growth patterns among orthodontic patients

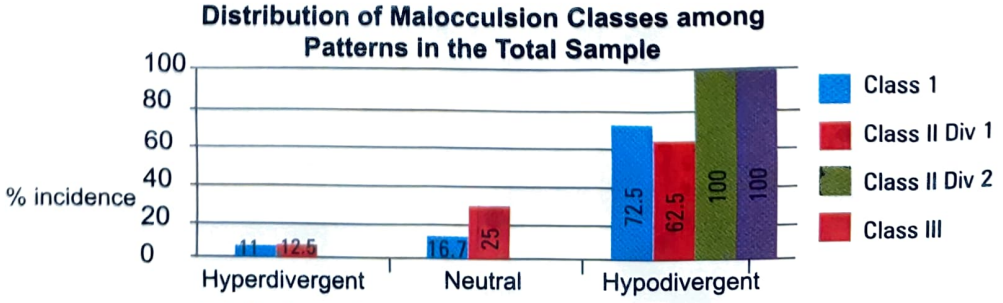

Fig 5: Distribution of malocclusion classes among pattern in the total sample

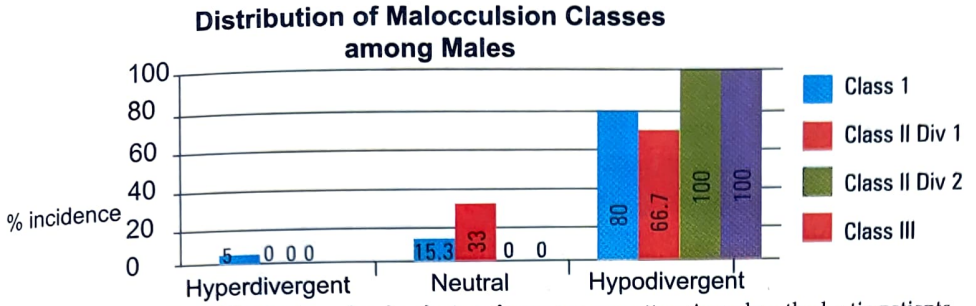

Fig 6: Distribution of malocclusion classes among pattern in male orthodontic patients

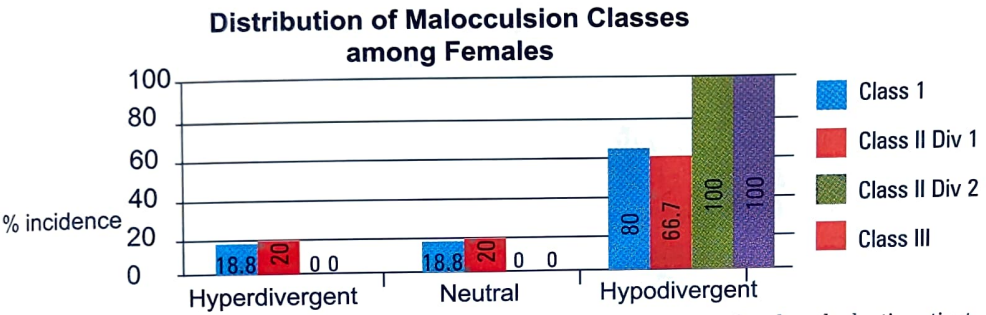

Fig 7: Distribution of malocclusion classes among pattern in female orthodontic patients

measurements in males were larger than female.

Relatively strong correlations were found between lower gonial angle, gonial angle, mandibular plane angle, palatal /mandibular plane angle, Frankfurt/mandibular plane angle SNB, Y Axis , sum of saddle + articular + gonial angles and posterior facial Height.

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SYNTHETIC TOOTH ENAMEL MAY LEAD TO MORE RESILIENT STRUCTURES

Unavoidable vibrations, such as those on airplanes, cause rigid structures to age and crack, but researchers at the University of Michigan may have an answer for that -- design them more like tooth enamel, which could lead to more resilient flight computers, for instance.

Most materials that effectively absorb vibration are soft, so they don't make good structural components such as beams, chassis or motherboards. For inspiration on how to make hard materials that survive repeated shocks, the researchers looked to nature.

"Artificial enamel is better than solid commercial and experimental materials that are aimed at the same vibration damping," said Nicholas Kotov, the Joseph B. and Florence V. Cejka Professor of Chemical Engineering. "It's lighter, more effective and, perhaps, less expensive."