How to Cite:
Khan, A., Bilal, A., Tabassum, H., Dil, M., Faisal, M. H., & Khan, M. S. (2023). Patterns of skeletal class II in patients reporting to Ayub Dental Section. *International Journal of Health Sciences*, *7*(S1), 1697–1702. https://doi.org/10.53730/ijhs.v7nS1.14401

Patterns of skeletal class II in patients reporting to Ayub Dental Section

Dr. Asadullah Khan
Resident Orthodontics, Saidu College of Dentistry
+92 346 4539447
Email: asadullahmk24@gmail.com

Dr. Amna Bilal
Chief Operating officer at DentoScope Institute of Advanced Dentistry, Rawalpindi
+92 323 5800081
Corresponding author email: Amna0795@yahoo.com

Hiba Tabassum
MDS Orthodontics
+92 333 0279273
Email: hiba.hanif@hotmail.com

Maryam Dil
Demonstrator Kohat Institute of Dental Sciences Kohat
+92 333 9217401
Email: dr.maryam_dil@yahoo.com

Mir Hadi Faisal
Senior Registrar, Islamabad Medical and dental college, Islamabad
+92 333 5049787
Email: Hadimir888@gmail.com

Muhammad Salman Khan
Demonstrator Kohat Institute of Dental Sciences Kohat
+92 334 9188653
Email: beingsalmon@gmail.com

Abstract---Researchers have used a variety of techniques to distinguish between the distinct elements of malocclusion. While some academics have used various indices to determine prevalence, the majority of researchers have followed Angle's categorization. Individual malocclusion studies, such as those looking at class II or class III malocclusion, have employed cephalometric analysis. Objectives: There is currently a lack of information in the literature about the prevalence of malocclusion in the Abbottabad region generally in the

Manuscript submitted: 27 Feb 2023, Manuscript revised: 09 April 2023, Accepted for publication: 18 May 2023

city among people of different ages that might benefit from orthodontic services. This study's goal was to assess local population skeletal class II patterns in order to better treat patients at the appropriate time by utilizing variations in skeletal class II patterns' growth periods. Methodology: From February 2022 to April 2023, the Department of Orthodontics at Ayub Dental Section, Abbottabad, conducted this retrospective (cross-sectional) study. The institutional ethical committee at Ayub Medical College in Abbottabad gave its approval to the plan. On a specially created proforma, data for 100 patients were collected using prior records. Patients of either gender who had skeletal class II jaw relationships with any dental relationships and were between the ages of 8 and 35 were required to meet the inclusion criteria. Patients with pathology, maxillofacial trauma, or orofacial syndromes were disqualified from the research. Results: 35 men (35% of the total) and 65 women (65%) were present. With a mean age of 15.65+4.12 years, their chronological ages varied from 10 to 33 years. The second decade (69%) was the age group with the highest frequency (Table I). Short mandible with high angle (60%) and short mandible with normal vertical pattern (9%) were the two most prevalent patterns in skeletal class II patients. The short mandible is the most prevalent class II pattern among the skeletal class II population, as seen in Table II. Table III displays the mean and standard deviation of class II patients' composite cephalometric analysis. Conclusion: Short mandibles (60%) and steep mandibular planes (36%) are the most prevalent patterns in the local population according to composite cephalometric.

Keywords---lateral cephalogram, short mandible, retrognathia.

Introduction

Researchers have used a variety of techniques to distinguish between the distinct elements of malocclusion.[1] While some academics have used various indices to determine prevalence, the majority of researchers have followed Angle's categorization. Individual malocclusion studies, such as those looking at class II or class III malocclusion, have employed cephalometric analysis. Malocclusion is the second most frequent dental defect after caries and can cause functional issues as well as negative effects on young people's psychological development.[2] A disorder characterized by abnormalities in tooth location, number, shape, and developmental position of teeth beyond normal limits is referred to as malocclusion. Malocclusion is described as "The mal-relationship between arches in any plane."

Malocclusions may occur for a variety of causes, including hereditary, environmental, or a mix of both, as well as local factors including poor dental hygiene practices, tooth growth in terms of location, shape, and form.[3] Treatments for malocclusion are frequently performed throughout adolescence, when the permanent dentition is beginning to emerge. There has not been much research done in Pakistan to determine the prevalence of malocclusion and its

constituent parts, particularly employing cephalometric analysis.[4] Instead of improper tooth positioning in relation to the jaws, skeletal class II is caused by anteroposterior jaw size or position disparity. Mandibular deficit or maxillary excess are two neatly differentiated types of skeletal class II malocclusion.[5] Skeletal class II manifests in a variety of ways, including maxillary excess with lower facial height (LFH) that is lowered, increased, or normal; mandibular deficiency with LFH that is decreased, raised, or normal; and combination of maxillary excess & mandibular deficiency with any pattern of lower facial height.

Although several techniques have been employed to identify skeletal class II patterns, the Cephalomatric Analysis is the most useful.[6-10] Orthodontists can determine skeletal class II patterns by clinical examination, but they cannot assess the degree of malocclusion through this method. Skeletal class II with mandibular deficit is more common among Asian populations.[11] There is currently a lack of information in the literature about the prevalence of malocclusion in the Abbottabad region generally in the city among people of different ages that might benefit from orthodontic services. This study's goal was to assess local population skeletal class II patterns in order to better treat patients at the appropriate time by utilizing variations in skeletal class II patterns' growth periods.

Methodology

From February 2022 to April 2023, the Department of Orthodontics at Ayub Dental Section, Abbottabad, conducted this retrospective (cross-sectional) study. The institutional ethical committee at Ayub Medical College in Abbottabad gave its approval to the plan. On a specially created proforma, data for 100 patients were collected using prior records. Patients of either gender who had skeletal class II jaw relationships with any dental relationships and were between the ages of 8 and 35 were required to meet the inclusion criteria. Patients with pathology, maxillofacial trauma, or orofacial syndromes were disqualified from the research. For each patient, a traced and analyzed lateral cephalogram was employed. An examination of composite cephalometry was done. Six parameters (five angular and one linear measurement) were utilized to assess patient vertical growth patterns, while three angular measurements and five linear measures were employed to assess sagittal relationship (Table I). In addition to the clinical examination, the diagnosis of various skeletal class II patterns included consideration of face type, facial divergence, chin position, and gummy grin. For a statistical analysis of the age mean, standard deviation, and gender ratio, the results from the completed questionnaire were then input in SPSS version 24.0.

Results

35 men (35% of the total) and 65 women (65%) were present. With a mean age of 15.65+4.12 years, their chronological ages varied from 10 to 33 years. The second decade (69%) was the age group with the highest frequency (Table I). Short mandible with high angle (60%) and short mandible with normal vertical pattern (9%) were the two most prevalent patterns in skeletal class II patients. The short mandible is the most prevalent class II pattern among the skeletal class II population, as seen in Table II. Table III displays the mean and standard deviation of class II patients' composite cephalometric analysis.

Table 1
Age Distribution of the participants

Age (Years)	N (%)
8-10	7 (7)
11-20	69 (69)
21-30	19 (19)
31-40	5 (5)

Table 2
The frequency of certain skeletal class II patterns

Skeletal pattern	(%)
Short mandible	60
Maxillary excess	36
Composite	4

Table 3
Analysis of composite cephalometric

Variable	Mean	S.D+
Sagittal Analysis		
SNB	65.73	2.47
SNA	72.23	2.80
ANB	5.47	0.48
SN-Length	51.3	6.53
AO-BO	1.67	0.60
Mand-Length	53.48	7.06
Vertical Analysis		
SN- Pt	7.12	2.67
SN-Mand angle	23.82	6.07
FMA	17.40	5.13
MMA	17.11	6.19
LAFH/TAFH	46.18	3.18
Y-Axis	57.57	5.05

Discussion

Instead of referring to malposition of the teeth in relation to the jaws, the term "skeletal class II" refers to one originating from anteroposterior disproportion in size or discrepancy in position of the jaws. At de'Montmorency, Waheed-ul-Hamid[12] used 100 patients to perform a research on the prevalence of the skeletal components of malocclusion. Although he looked at all forms of malocclusion, his skeletal class II data suggest that retrognathic mandibular (29%) and high angle (38%) instances were the most frequent patterns. The findings of the study are pretty comparable to those of ours. Through the use of computer-based statistical methods, Moyers[13] conducted a research in which various varieties of class II malocclusion were identified, including six types in the anteroposterior dimension of the face and five types in the vertical utilising cephalometric analysis. His

research found that small mandibles and squarish faces with a somewhat high tilt were most prevalent. Early dentofacial characteristics of class II malocclusion were studied longitudinally from deciduous to mixed dentition by Syverson el al.[14] They also came to the conclusion that class II findings were the most common due to small mandibles and vertically increasing lower anterior facial height, which supports our study. Using anteroposterior and vertical Cephalomatric analysis, Plaza et al[15] investigated various malocclusion patterns in the Chinese population. His research revealed that small mandibles and steeper mandible planes had the highest percentages.

Conclusion

Short mandibles (60%) and steep mandibular planes (36%) are the most prevalent patterns in the local population according to composite cephalometric.

References

1. Matsuda S, Yamaguchi T, Mikami S, Yoshimura H, Gotouda A. Can malocclusion provide clinicians with information for differential diagnosis of temporomandibular joint diseases?: A review. Medicine. 2022 Aug 8;101(33).
2. ullah Khan A, Rehman A, Hameed A, Adil S, Khan MS, Malik A. FREQUENCY OF MALOCCLUSION IN GOVERNMENT HIGH SCHOOL GOING CHILDREN AGED 13-17 IN PESHAWAR. Journal of Khyber College of Dentisrty. 2021 Sep 30;11(03):31-6.
3. Huang YW, Kuo CL, Liu IH, Tsai YL, Wang CL, Yang CH. Orthodontic Treatment of Severe Bimaxillary Dentoalveolar Protrusion with Skeletal Class II Malocclusion Without Using Miniscrews. Taiwanese Journal of Orthodontics. 2022;34(1):6.
4. Ghodasra R, Brizuela M. Orthodontics, Malocclusion. InStatPearls [Internet] 2023 Apr 23. StatPearls Publishing.
5. Khan J, Singer SR, Young A, Tanaiutchawoot N, Kalladka M, Mupparapu M. Pathogenesis and Differential Diagnosis of Temporomandibular Joint Disorders. Dental Clinics. 2023 Apr 1;67(2):259-80.
6. Inchingolo AD, Ceci S, Patano A, Inchingolo AM, Montenegro V, Di Pede C, Malcangi G, Marinelli G, Coloccia G, Garibaldi M, Kruti Z. Elastodontic Therapy of Hyperdivergent Class II Patients Using AMCOP® Devices: A Retrospective Study. Applied Sciences. 2022 Mar 23;12(7):3259.
7. Wang T, Yang Z, Yang F, Zhang M, Zhao J, Chen J, Li Y. A three dimensional study of upper airway in adult skeletal Class II patients with different vertical growth patterns. PloS one. 2014 Apr 22;9(4):e95544.
8. Wilhelm BM, Beck FM, Lidral AC, Vig KW. A comparison of cranial base growth in Class I and Class II skeletal patterns. American Journal of Orthodontics and Dentofacial Orthopedics. 2001 Apr 1;119(4):401-5.
9. Al-Hadad SA, ALyafrusee ES, Abdulqader AA, Al-Gumaei WS, Al-Mohana RA, Ren L. Comprehensive three-dimensional positional and morphological assessment of the temporomandibular joint in skeletal Class II patients with mandibular retrognathism in different vertical skeletal patterns. BMC oral health. 2022 Dec;22(1):1-2.
10. Katsavrias EG, Halazonetis DJ. Condyle and fossa shape in Class II and Class III skeletal patterns: a morphometric tomographic study. American

journal of orthodontics and dentofacial orthopedics. 2005 Sep 1;128(3):337-46.
11. Klocke A, Nanda RS, Kahl-Nieke B. Skeletal Class II patterns in the primary dentition. American journal of orthodontics and dentofacial orthopedics. 2002 Jun 1;121(6):596-601.
12. Waheedul-Hamid AS, Mcps MS. Prevalence of skeletal components of malocclusion using composite cephalometric analysis. Pak Oral Dent J. 2003;23:137-44.
13. Moyers RE, Riolo ML, Guire KE, Wainright RL, Bookstein FL. Differential diagnosis of Class II malocclusions: Part 1. Facial types associated with Class II malocclusions. American journal of orthodontics. 1980 Nov 1;78(5):477-94.
14. Syverson A, Li C, Zheng Z, Proskurnin E, Chung CH, Zou M. Maxillary sinus dimensions in skeletal class II population with different vertical skeletal patterns. Clinical Oral Investigations. 2022 Jul;26(7):5045-60.
15. Plaza SP, Reimpell A, Silva J, Montoya D. Relationship between skeletal Class II and Class III malocclusions with vertical skeletal pattern. Dental press journal of orthodontics. 2019 Sep 5;24:63-72.