

MALOCCLUSIONS AND DENTAL ANOMALIES IN CLEFT LIP AND/OR CLEFT PALATE PATIENTS RECEIVING ORTHODONTIC TREATMENT: A MULTICENTER STUDY**Noor Aini Mansor^{1*}, Siti Aishah Salim¹, Syirahaniza Mohd Salleh², Shahrul Aiman Soelar³,**¹Orthodontic Unit, Kotar Setar Dental Specialist Clinic, Alor Setar, Kedah²Pejabat Kesihatan Pergigian Daerah Kota Setar/Pendang, Alor Setar, Kedah³Clinical Research Centre, Hospital Sultanah Bahiyah, Alor Setar, Kedah

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Introduction

Cleft lip and/or palate (CLP) are congenital anomalies that pose significant challenges to oral health, resulting in malocclusions and dental anomalies. Orthodontic treatment for CLP patients involves early intervention and multidisciplinary care. This multicenter study aimed to investigate the prevalence and associations of malocclusions and dental anomalies among CLP patients receiving orthodontic treatment in Kedah, Malaysia.

Methods

This retrospective cross-sectional study involved data collection of CLP patients in all government orthodontic clinics in Kedah from 2014 to 2023. Based on the prevalence of 0.636 (Baek et al., 2002), with 0.05 types I error, 0.07 precision, and 20% dropout adjustment, the final calculated sample size was 228. Quota sampling was applied, and Probability Proportional to Size (PPS) sampling was used to ensure fair distribution of samples across all clinics. Eligible cases were identified, and data collected included demographic, types of clefts, malocclusion and dental anomalies such as hypodontia, hyperdontia and impacted teeth. This information were obtained from dental records and radiographs. Data analysis was performed using Jamovi software version 2.6. Categorical variables were presented as frequencies and percentages, while non-normally distributed numerical data were reported as medians with interquartile ranges. Associations between demographics, malocclusions, dental anomalies and cleft types were tested using Pearson's chi-square, with Fisher's exact test applied where assumptions were not met.

Results

A total of 258 dental records were included in this study. The median age of subjects was 11.0 years old. The demographic characteristics of the respondents are detailed in Table 1. Most of the subjects were female (54.3%) and Malay ethnicity (84.1%). Unilateral cleft lip and palate (UCLP) was the most prevalent cleft type (65.1%) followed by bilateral cleft lip and palate (BCLP) (26.4%). Class III malocclusion predominated (78.3%). Hypodontia was the most common dental anomaly (57.8%). Gender ($p=0.003$) and ethnicity ($p=0.048$) were significantly associated with cleft types, with males more likely to have BCLP and females more likely to have cleft palate (CP). Hypodontia ($p=0.010$) and hyperdontia ($p=0.030$) showed significant associations with cleft types.

Table 1. Demographic characteristics of respondents (N=258)

Variables	<i>n</i>	(%)	
Age group (in years)	11.0	(3.00) ^a	
	7-12	178	(69.0)
	13-17	58	(22.5)
	18-29	20	(7.8)
	>30	2	(0.8)
Gender	Male	118	(45.7)
	Female	140	(54.3)
Ethnicity	Malay	217	(84.1)
	Chinese	30	(11.6)

Types of clefts	Indian	8	(3.1)
	Others	3	(1.2)
	CL	4	(1.6)
	CP	18	(7.0)
	Unilateral CLP	168	(65.1)
	Bilateral CLP	68	(26.4)
Types of malocclusions	Class I	38	(14.7)
	Class II/1	12	(4.7)
	Class II/2	6	(2.3)
	Class III	202	(78.3)
Dental anomalies	Hypodontia: Present	171	(57.8)
	Impacted tooth: Present	71	(24.0)
	Hyperdontia: Present	54	(18.2)

Note: ^aPresented as median (interquartile range);

CL = Cleft Lip, CP = Cleft Palate, CLP = Cleft Lip and Palate.

Discussion

The high prevalence of Class III malocclusion and hypodontia highlights the need for early orthodontic interventions in CLP patients. Findings from this study indicated that hypodontia and hyperdontia were significantly linked to the types of clefts. Gender and ethnic disparities in cleft types suggest potential etiological differences. As this study was confined to Kedah, findings may not represent Malaysia's population. Secondary dental records may introduce bias from missing or inconsistent information. The lack of longitudinal follow-up hinders comprehension of treatment results thus, future prospective research is required. These findings underscore the importance of early detection and multidisciplinary care to optimize outcomes for CLP patients.

Keyword: Malocclusions, dental anomalies, cleft lip, cleft palate, unilateral, bilateral, multicenter