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# The Characteristics and Prevalence of Cleft Palate Patients in RSUP Dr. Hasan Sadikin Bandung, Indonesia: 3 Years Retrospective Study

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**Abstract**

**Introduction:** Cleft lip and palate are the most common congenital malformation affecting the head and neck and the second most common congenital abnormalities in general. This study aimed to determine the characteristics and prevalence of cleft palate in the RSUP dr. Hasan Sadikin Bandung.

**Method:** This retrospective study evaluated 79 patients diagnosed with cleft palate and underwent palatoplasty in RSUP dr. Hasan Sadikin Bandung between September 2018 and September 2021. The extracted data included based on characteristics of age, gender, type classification according to *Veau*, family history with cleft lip/palate, domicile of origin, and other accompanying syndromes. Incomplete medical record was excluded.

**Result**: 79 patients were included in this study with 53% male, under 2 years old 62%. 76 patients (96, 2%) were nonsyndromic cleft palate with *Veau* type III were the most common diagnosis 38%. No familial history in most patients (93%). Majority patients came from Bandung City (29, 11%).

**Conclusion:** In our study cleft palate involving lip unilateral was the most cleft type. These findings may provide references for understanding the characteristics of cleft palate in RSUP Dr. Hasan Sadikin Bandung, Indonesia.

**Keywords:** Palatoschizis, Characteristic, Prevalence

## Introduction

Cleft lip with or without cleft palate are the most common congenital anomalies affecting the head and neck and the second most common congenital abnormalities in general.[1] Previous study explained that in New Haven, Connecticut cleft palate incidence is about 1 per 1593 live births.[2] Cleft palate occurs congenitally from failure of palatal shelf fusion. Study by Wu (2017) report that cleft palate can occur in isolation, or with a concurrent cleft lip at a rate of 6.64 per 10,000 live births. The Incidence of cleft palate in Indonesia is about 25.5%. Children with cleft palate often struggle with feeding, speech, appearance, ear infections, and hearing loss.[3,16]

The incidence varies widely depending on geographic origin, racial and ethnic, environmental exposures, and socioeconomic status. The highest is Asian, intermediate prevalence in Caucasian, and the lowest prevalence is African.[4] It is suggested that the multiple genes and environmental factors are associated with the formation of this anomaly.

Moreover, the impact of other factors such as consanguineous marriage, passive maternal smoking, and regular alcohol intake increase the risk of cleft.[5]

Palatogenesis occurs during weeks 5 thorough 12 of development. The primary palate which includes the central maxillary alveolar arch with the four incisor teeth and the hard palate anterior to the incisive foramen develops first from the rapid expansion of the frontonasal prominence and fusion of the medial nasal prominences. The secondary palate then develops from the fusion of the palatine shelves which elongate adjacent to the tongue, and as the mandible grows, the tongue descends in the oral cavity allowing the palate shelves to elongate and elevate above the tongue. Fusion of the palate occurs from an anterior to posterior direction beginning at the incisive foramen and occurs from weeks eight through 12 of gestation, concluding with uvular fusion. The point during development during which fusion is interrupted determines the degree of clefting noted clinically.[6]

The techniques used for cleft palate repair depending on the specific type of cleft palate. There are many classification systems that have been developed and implemented during the history of cleft care. The most frequent one used in both clinical work and research is the *Veau* classification. In this study, we also used *Veau* classification to classify our data. The *Veau* classification system was developed as a response to the Brophy classification system (Brophy's classification was lauded by the Annals of Surgery (McWilliams, 1924) since many surgeons considered the system overly complex and impractical. The *Veau* classification system divides the cleft lip and palate into four groups, which are A: Group I. Defects of the soft palate only. B: Group II. Defects involving the hard palate and soft palate. C: Group III. Defects involving the soft palate to the alveolus, usually involving the lip. D: Group IV. Complete bilateral clefts.[7]

Dr. Hasan Sadikin General Hospital is the main referral hospital in West Java, Indonesia. There was limited study about prevalence of cleft palate in West Java, so the writer are interested in researching about Characteristics and Prevalence of Cleft Palate Patients at RSUP dr. Hasan Sadikin General Hospital.

## Method

This study is a descriptive study with a retrospective design using medical record data of patients diagnosed with cleft palate at RSUP Dr. Hasan Sadikin who underwent Palatoplasty ~~in~~ under general anesthesia between September 2018 and September 2021. Epidemiological and clinical information were extracted from the medical record included age, gender, type classification according to *Veau*, family history of cleft lip/palate, domicile of origin, and other syndromes that patients had. Incomplete medical record was excluded. Data was collected and tabulated by using Microsoft Excel 2007 and presented in number and percentage. Appropriate ethical clearance was obtained from the ethical committee of Universitas Padjadjaran number 666/UN6.KEP/EC/2021.

## Result

There were 96 patients diagnosed with cleft palate who underwent palatoplasty in RSUP dr. Hasan Sadikin Bandung from September 2018 to September 2021, 17 of them were excluded due to incomplete data and 79 patients were included. Based on age, the highest number of patients who underwent palatoplasty surgery were under 2 years old with 49 patients (62%), and the lowest number was patient with age between 5-6 years old (1%) (Table 1).

**Table 1: Characteristics by age**

| Characteristics | Frequency (n=79) | Proportion (%) |
|---|---|---|
| **Age** | | |
| Under 2 years old | 49 | 62% |
| 2-3 years old | 20 | 25% |
| 4-5 years old | 4 | 5% |
| 5-6 years old | 1 | 1% |
| Over 6 years old | 5 | 7% |

Based on gender, the highest number were male (53%) ((Figure 1). The most common type of cleft palate was *Veau* type III (38%), followed by type II (32%), and type I (7%) (Table 2).

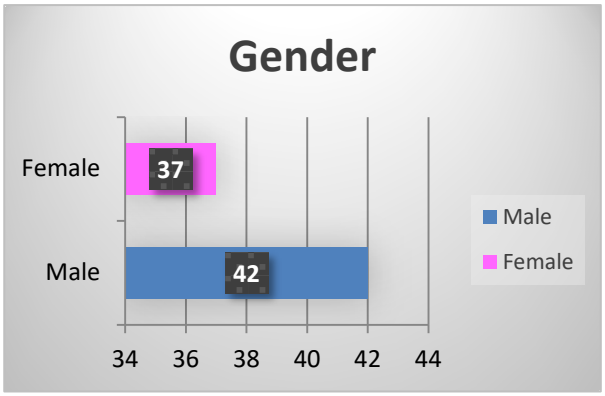


**Figure 1: Diagram of patient characteristics by gender**

**Table 2: Characteristics by Veau classification**

| Characteristics | Frequency (79) | Proportion (%) |
|---|---|---|
| **Classification of cleft according to Veau** | | |
| Type I | 6 | 7% |
| Type II | 25 | 32% |
| Type III | 30 | 38% |
| Type IV | 18 | 23% |

In total, 79 patients were included, consisting of 6 patients who had a history of cleft in the family (7%) and 73 patients from the family with no history of cleft (93%) (Figure 2). Based on the domicile, our data showed that 23 patients from Bandung City, 13 patients from West Bandung, 10 patients from Bandung Regency, and Bekasi, Cianjur, Indramayu, Majalengka, Sukabumi, and Sumedang had only 1 patient, respectively. Our data also had 3 patients with cleft palate with accompanying syndromes (3, 79%) (Figure 4).

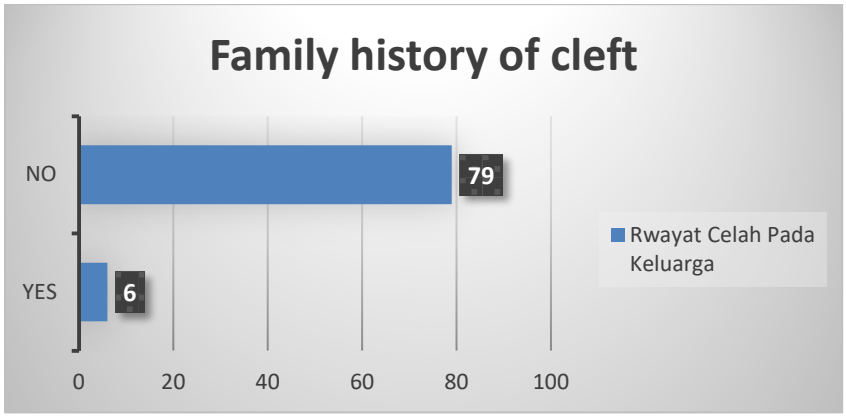


**Figure 2: Diagram of patient characteristics by family history of cleft**

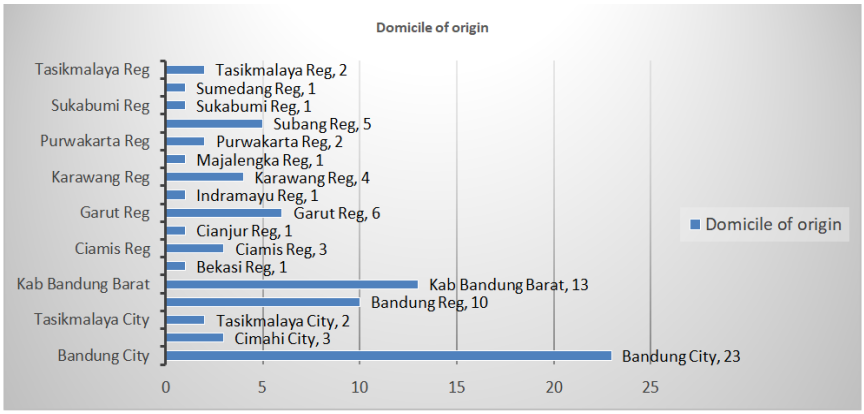


**Figure 3: Diagram of patient characteristics by domicile of origin**

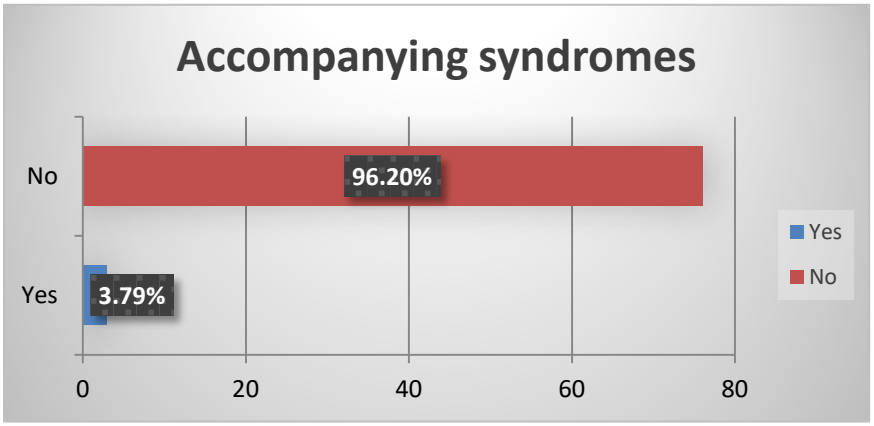


**Figure 4: Diagram of patient characteristics with any accompanying syndromes**

## Discussion

From this study the largest number patient diagnosed with cleft palate and underwent palatoplasty was found in under 2 years old (62%). However previous study conducted a study in Iran, this study analyzed 215 patients with patients who under 1 year old were 48.42.6%.[5] This is because patients who are operated at RSUP Dr. Hasan Sadikin Bandung were performed palatoplasty surgery at 18-24 months old, while those who under 1 year old are performed veloplasty surgery. Previous study with similar result with our study reported most of patient that came for treatment is between age

1-5 years old (66.4%) and only 5% of them were under 1 year old, this result showed that knowledge and care from the parents still need to improve.[8] Additionally, a study in Algeria by Abou Bekr (2022) conducted a study that included 85 patients with 35% and 15% among their data underwent surgery procedures between 10-18 months, and 18-24 months, respectively.[9]

This study showed that the prevalence of cleft palate was higher in male patient than the female patient and result follows the statements of several previous studies. Males are affected more often and have more severe cleft than females. However, females are more often affecting with isolated cleft palate than males. Isolated cleft palate is more common in women than in men due to several reasons including women having a development period of a prone palate that is one week longer than men and sex hormone in women in triggers cleft palate. [4,5,10,11]

From this study the highest percentage was found in type III (38%), then followed by *Veau* type II (32%). This is in line with research by Emodi et al (2022) who conducted research in Israel that report from 258 patient's higher incidence was *Veau* II and III. Emodi also made conclusion from his study that the incidence of severe cases that have presented (Veau III and IV) decreased every year whereas mild cases (Veau type I and II) demonstrated a marked increase.[12,13]

The percentage of patients based on a history of cleft in the family shows that the largest number is found in patients who do not have a history of cleft in the family (93%) and those who have a history of cleft in the family (7%). Research by Galeh et al (2020) in Iran showed result about 20.86% patient with cleft has family history with cleft lip or palate.[1] Other study was in Saudi arabia that reported there were 4 patient (25%) that has family history with cleft lip or palate.[5,14] This result explained that orofacial cleft is known to have an increased frequency in relatives of family members with a cleft.

Based on the domicile, our data showed that 23 patients from Bandung City, 13 patients from West Bandung, 10 patients from Bandung Regency, and Bekasi, Cianjur, Indramayu, Majalengka, Sukabumi, and Sumedang had only 1 patient, respectively. Patients mostly came from the city of Bandung because their home are closer to hospital then other cities. Previous study in China by Zhu (2021) also reported there was 926 patients diagnosed with cleft palate came from urban residential areas whereas 609 patients came from rural residential areas.[15] These result also supported by another study that conducted in Jember, this study explained that geographical location affects the incidence of clefts, Jember is an area where the majority of the population are tobacco farmers, and the high level exposure of tobacco can increase the prevalence of clefts in this area.[16]

Our data also had 3 patients syndromic (3,79%) two patients had Pierre Robin syndrome and one patient with Downs syndrome, and the rest were nonsyndromic cleft palate (96,3%). This result supported by previous study that conducted in Iran, this study analyzed 1500 patient, and 16 patients among them had accompanying syndrome. Although the theory presented that more than 300 types of genetic syndromes are accompanied by orofacial cleft. Orofacial cleft could be the manifestation of more than 250 syndromes and cardiac anomaly reported as one of the highest incidences.[10] Study by Ramanan et al (2019) report of the total 2367 patients 9% had associated with another congenital malformation and the highest number was seen in patients with isolated clef palate (24,89%).[17]

## Conclusion

Our study concludes that the characteristics and prevalence of cleft palate depending on racial and ethnic, environmental exposures, geographic origin, and socioeconomic status. We found that the most palatoplasty was carried out at the age of under 2 years. The highest prevalence was male, and the most common type of cleft palate was *Veau* type III. We also conclude that the patient

who had no family history with cleft lip or palate, patient who came from Bandung City, and nonsyndromic cleft palate has the higher cleft palate incidence than others.

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