Sapporo Medical Journal
Volume 54, Issue 06, June, 2020

Maternal Profile of Cleft Lip and/or Palate Patient in HayandraPeduli Foundation, Indonesia: A 5-Year Descriptive Study

Karina Karina[1,2], Fransisca[3], Kevin Leonard Suryadinata[4]

KlinikHayandra, YayasanHayandraPeduli, Jakarta, Indonesia[1]
HayandraLab, YayasanHayandraPeduli, Jakarta, Indonesia[2]
University of Indonesia, Jakarta, Indonesia[3]
Udayana University, Bali, Indonesia[4]

Abstract— Cleft lip and palate incidence is influenced by various factors. Many studies about maternal risk factors have been investigated, but it results variedly. This study wants to give a glimpse about maternal profile of cleft's patient in Indonesia. The data was collected from 2014 to 2018, from social service held by HayandraPeduli Foundation. The data collected primarily, and 604 subjects obtained. The most common age group was 30-39 (41.5%) with 27.2% of all subjects were under 20 or over 35 years old of age. Most of the subjects (94.21%) have education level below diploma, still presumably related to low socioeconomic status of the family. Most of the patient (99.8%) already had routine antenatal care during pregnancy period to health officers and most of them went to midwife's office (58.6%). Events related to pregnancy which related to cleft incidence and were recorded in this study: preterm birth (5%), history of miscarriage (13.4%), and serious illness and/or complication during child birth (5.6%). In this study most of the subjects (96.2%) consume fruits and vegetable at least once a week, while seven subjects (1.2%) were active smokers, and 70.2% of subjects were passive smokers. 18% of subjects had had an exposure to x-ray during their pregnancy period. Several maternal risk factors in Indonesia, including socioeconomic, events during pregnancy, history of previous miscarriage, dietary and smoking habits, and environment factors, possibly held accountable for cleft incidence in Indonesia.

Keywords— maternal, cleft, social services, Indonesia, profile

Clinical Relevance
Maternal risk factors of cleft studies from other countries cannot be applied, because it is different to one place from another due to geographic, ethnic, and socioeconomic factors. Internal unique profile is generated, and is the first step to identify possible maternal risk factors and for giving insights to prevention program.

Background
Cleft lip and/or palate are the most common congenital abnormalities in human. Non-syndromic cleft lip and palate has a proportion of around 70% from all cleft lip and/or palate cases. [1]The incidence of cleft lip and/or palate is influenced by various factors, particularly affected by genetic and environmental factors. According to WHO, the prevalence of cleft lip and/or palate is currently around 1 in 700 live births. The highest number is Asian descent (14:10.000 live births), and the lowest number is African descent (4:10.000). In Indonesia, the prevalence of cleft lip is 0.2%. [2]

Risk factors such as maternal exposure to tobacco smoke, alcohol, poor nutrition, viral infection, medicine, and teratogens in early pregnancy, have previously been investigated. [3-8]The aim of this study is to describe the maternal profile among cleft lip and/or palate patient who has been treated by

HayandraPeduliFoundation. Thus, this study could become the first step toward primary prevention of cleft lip and/or palate incidence in Indonesia.

Methodology

We conducted retrospective descriptive study to describe maternal profile among cleft lip and/or palate patient in HayandraPeduli Foundation. From 2014 to 2018, data were obtained from all over Indonesia when the social service was held. Subjects are the mothers of the cleft patients. They were asked voluntarily to fill the previously prepared form. 797 data of subjects had been documented and preserved. 193 data of subjects were incomplete thus they were excluded from this study. Only non-syndromic cleft subjects were included.

Data such as maternal age, subjects' educational background, antenatal care visitation, events during pregnancy, history of previous pregnancy, nutrition, exposure to tobacco smoke, and exposure to radiation during pregnancy were recorded. Data is presented in narrative, table, bar chart, and pie chart. The data transformation using SPSS 23.

Results

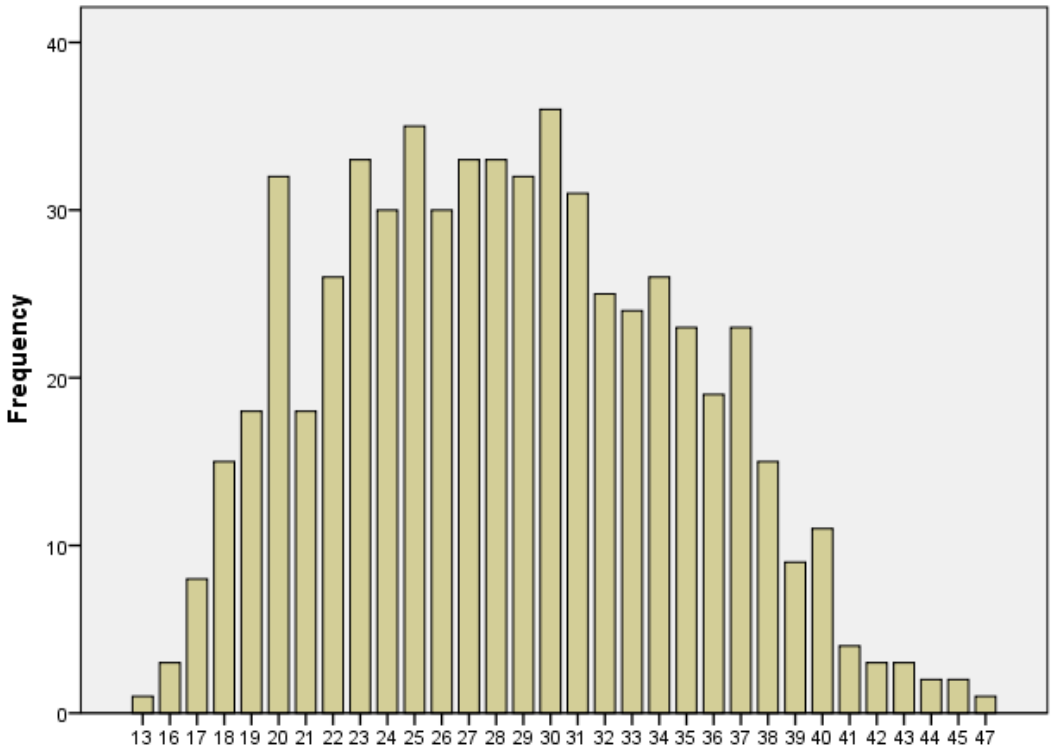

Figure 1. Maternal age.

Table 1. Subjects' educational background.

Education	n (%)
No formal education	6 (1.0)
Elementary school	200 (33.1)
Junior high school	183 (30.3)
Senior high school	180 (29.8)
College or above	35 (5.8)

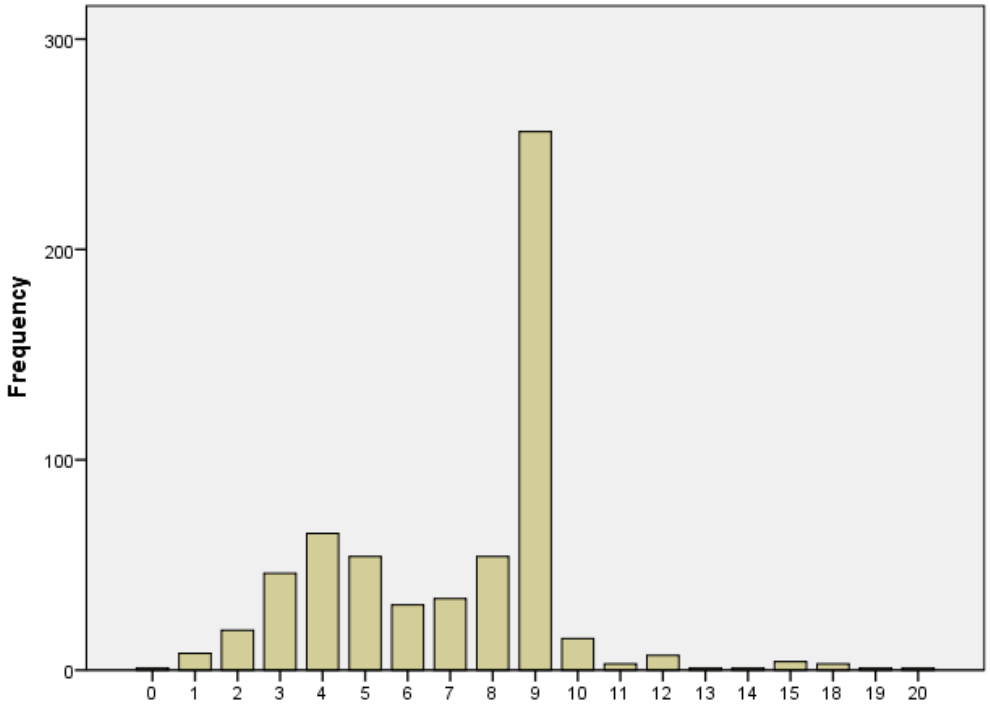

Figure. 2. Number of antenatal care visitation during pregnancy of child with cleft.

Table 2. Antenatal care visitation.

Place	n (%)
Midwife	354 (58.6)
Traditional Practitioner	1 (0.2)
Doctor's clinic	48 (7.9)
Maternity center in village (Polindes)	1 (0.2)
Integrated health service (Posyandu)	8 (1.3)
Community health center (Puskesmas)	175 (29)
Hospital	17 (2.8)

Table 3. Conditions related on pregnancy.

Conditions	n (%)
Duration of pregnancy (months)	
7	8 (1.3)
8	22 (3.6)
9	553 (91.6)
10	18 (3.0)
11	3 (0.5)
History of miscarriage(s)	
Yes	81 (13.4)
No	523 (86.6)
Number of miscarriage(s) before pregnancy of child with cleft	
0	525 (86.9)
1	65 (10.8)
2	9 (1.5)
3	4 (0.7)
4	1 (0.2)
Experiencing serious illness/complications during childbirth	
Yes	34 (5.6)
No	570 (94.4)

Table 4. Habits of the subjects.

Habits	n (%)
Eat vegetables and fruits	
Yes	575 (95.2)
No	29 (4.8)
Eat instant noodle	
Yes	373 (61.8)
No	231 (38.2)
Active smoking	
Yes	7 (1.2)
No	597 (98.8)
Passive smoking (from patients' father)	
Yes	424 (70.2)
No	180 (29.8)

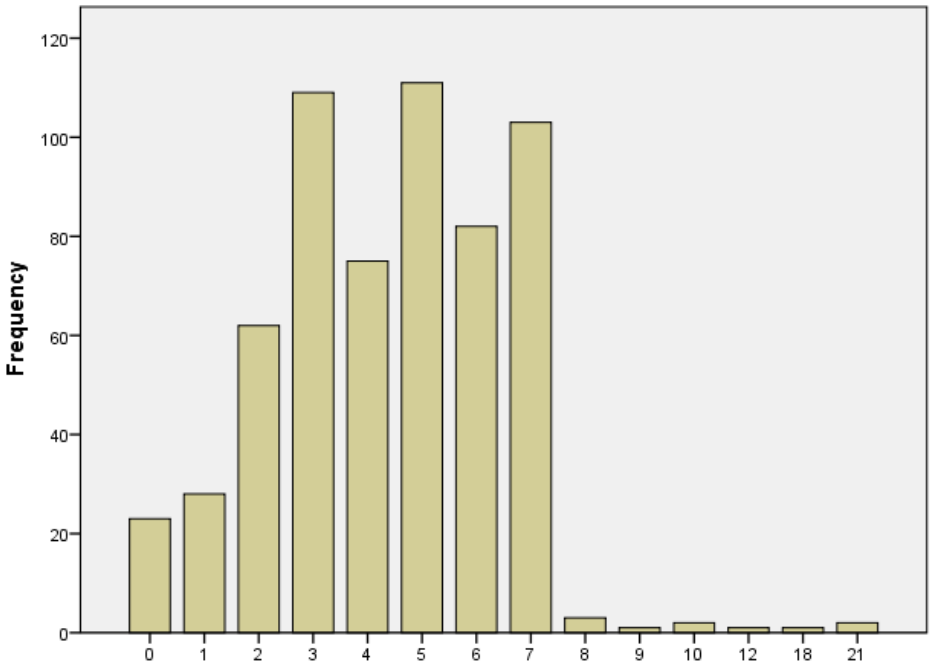

Figure. 3. Subjects' frequency of eating vegetables and fruits in 1 week.

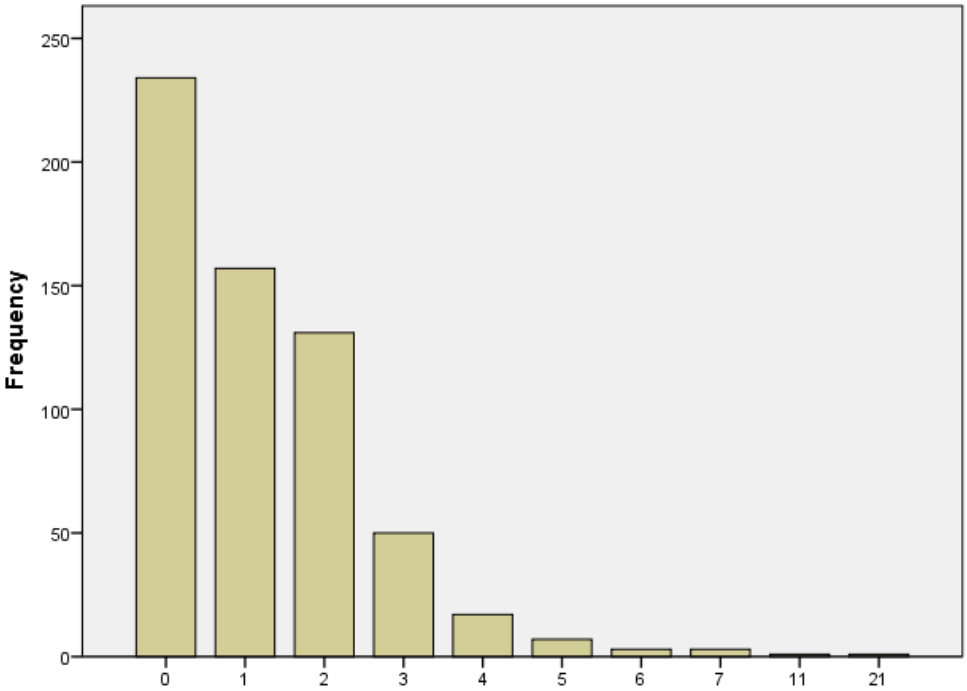

Figure. 4. Subjects' frequency of eating instant noodle in 1 week during pregnancy.

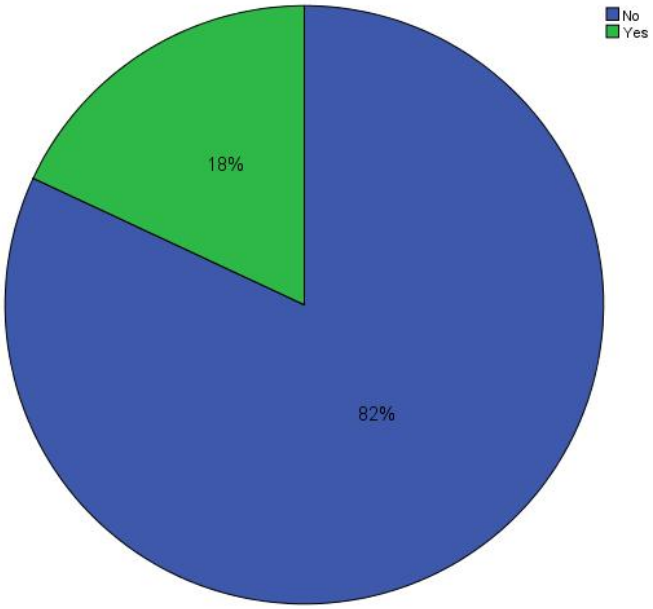

Figure. 5. X-ray exposure during pregnancy.

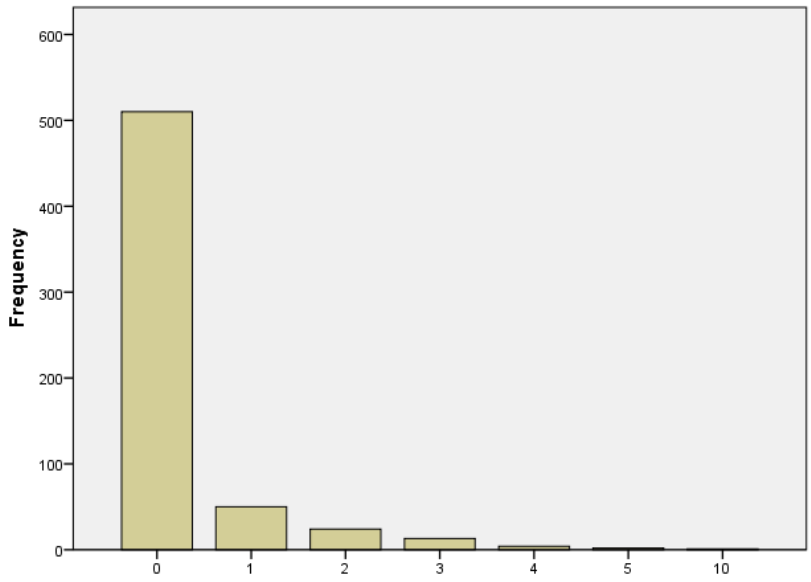

Figure. 6. Frequency of X-ray exposure during pregnancy.

The maternal age distribution is shown in Figure 1. The modus of maternal age of subjects was 30 years old. Subjects' educational background is presented in Table 1, with the highest number proportion was elementary school (n=200; 33.1%). Most of them have done 9 times of antenatal care visitation (Figure 2). Table 2 shows where they were given antenatal care. Among the 604 subjects, 354 (58.6%) were managed by midwife. Regarding the conditions related on pregnancy, most of patients' mother had 9 months duration of pregnancy (n= 553, 91.6%) (Table 3). 523 (86.6%) of them had no miscarriage history, while 81 (13.4%) of them had miscarriage history (Table 3). We also found that 94.4% of subjects had experiencing no serious illness/complications during childbirth (Table 3). Table 4 presents data to describe subjects' habits. Almost all of them eat vegetables and fruits (n=575, 95.2%), with the highest number of frequencies was 5

times in a week (Figure. 3). 61.8% of subjects routinely eat instant noodle (Table 4). Their frequency of eating instant noodle in a week during pregnancy are shown in Figure 4 with the most common group is the non-eating one (38.2%). In terms of smoking habit, 597 (98.8%) of subjects had no active smoking habit, but 424 (70.2%) of them had passive smoking exposure from their husband (Table 4). The other profile is X-ray exposure during pregnancy, which is shown in Figure 5. 82% of patients' mother had no X-ray exposure during pregnancy, which is the most occurrence. The frequency of X-ray exposure during pregnancy is shown in Figure 6, which the most common frequency was 0 time.

Discussion

Maternal risk factors are important factors in cleft lip and palate development. Socioeconomic, environment, genetic, and biological factors are involved. However, there are inconsistency between studies. Our study shows the most common maternal age is 30 years old, with the most common age group is 30-39 (41.5%). Some studies report no significant correlation between maternal age and incidence of cleft lip and palate. [9] In contradiction, other studies show maternal age under 20 years and above 35 years are risk factors for cleft lip and palate. [10]Such group only compromise 27.2% of the subjects.

In our study, 94.21% of subjects has low education, which is below diploma. The most common educational level is elementary school (33.1%). Golalipour, et al also report 75.7% maternal education is below diploma. However, there is no significant association between maternal education level and incidence of cleft lip and palate compared to control group. [9] We assumed low educational level did not directly relate to cleft incidence, but possibly it related to low socioeconomic status of the family, thus become one of the affecting factors of cleft incidence.

Most of the subjects have routine antenatal visit, nine times during gestation. Antenatal examination is conducted in midwife's office (58.6%), community health care (29%), and doctor's clinic (7.9%). Other places are local health care, hospital, and traditional practitioner. Antenatal visit frequencies and place may impact cleft lip and palate development, directly or indirectly. During a proper antenatal visit, examiner should give multivitamin, including folic acid. Lack of folic acid is well known non-syndromic cleft lip and palate risk factor. Although folic acid has no protective role against syndromic cleft palate. [11,12]

In this study, approximately 5% of all cases are preterm birth. Wyszynki, et al showed preterm birth and low birth weight are risk factors for cleft development. [13] Miscarriage is found in 13.4% of subjects, which the majority is the one who have one history of miscarriage (10.8%). Some studies report higher cleft lip and palate incidence in mother with previous history of still birth or miscarriage. [14,15]

Thirty four subjects (5.6%) encounter serious illness and/or complication during child birth. It is still debatable, but some illness, including TORCH infection may affect pregnancy and lead to congenital defects. Indirectly, illnesses may also cause cleft due to drugs consumption. [16-18]Goveas shows no association between cleft and maternal illness and drug consumption during pregnancy. [19]

Most subjects consume fruits and vegetable at least once a week. Krapels, et al claims high vegetables and fruit consumption reduce the risk of cleft lip and palate. In addition, higher fiber, vegetable protein, ascorbic acid, iron, and magnesium consumption also needed to decrease cleft risk. [20] Imbalance and insufficient dietary may cause anaemia. A study in India declare that anaemia is an important risk factor of cleft lip and palate. [21]

Seven (1.2%) subjects in this study are active smoker. Smoking is a consistent risk factor of cleft lip and palate development, both active and passive. A meta-analysis published in 2016 confirms this consistency with relative risk 1.2–1.4. [22] Although active smoker prevalence in this study is low, passive smoker is more common (70.2%). Many studies showed that passive smoker significantly increase cleft lip and palate

risks and the increment is dose-related. [23,24]

X-ray exposure during pregnancy is found in 18% subjects. Due to its teratogenic effect, X-ray exposure is prohibited for pregnant women. Lim, et al claims significant increase of congenital defects risk due to radiographic examination during pregnancy, especially in the first trimester. [25] Occasionally, mother has not realize her pregnancy in the beginning, which lead to X-ray exposure during first trimester.

Conclusion

Cleft lip and/or palate is multifactorial congenital defect, and maternal factor is an important one. This study describe several maternal risk factors in Indonesia, including socioeconomic (age and education level), events during pregnancy (antenatal visit, gestational age at birth, complication and/or illness), history of previous miscarriage, dietary pattern, and environment (smoke and radiation exposure) factors.

References

[1] Mossey PA, Little J, Munger RG, Dixon MJ, Shaw WC. Cleft lip and palate. Lancet 2009;374:1773-1785. http://dx.doi.org/10.1016/S01406736(09)60695-4

[2] Wahyuni N, Latifah S. KondisiLingkungan di Nusa Tenggara TimurdanPrevalensiKejadianCelahBibirdanCelahLangitan: BIMKMI, 2016; 4(1):7.

[3] Dixon MJ, Marazita ML, Beaty HT, Murray JC. Cleft lip and palate: understanding genetic and environmental influences. Nature 2011;12:167-178.

[4] Zhu H, Kartiko S, Finnell RH. Importance of gene-environment interactions in the etiology of selected birth defects. Clin Genet 2009;75:409-423. PMid:19459879. http://dx.doi.org/10.1111/j.1399-0004.2009.01174.x

[5] Boyles, DeRoo LA, Lie RT, Taylor JA, Jugessur A, Murray JC, et al. Maternal alcohol consumption, alcohol metabolism genes, and the risk of oral clefts: a population-based case-control study in Norway, 1996–2001. Am J Epidemiol 2010;172:924-931. PMid:20810466 PMCid:2984244.

[6] Jentink J, Loane MA, Dolk H, Barisic I, Garne E, Morris JK, et al. Valproic acid monotherapy in pregnancy and major congenital malformations. N Engl J Med 2010;362:2185-2193. PMid:20558369. http://dx.doi.org/10.1056/NEJMoa0907328

[7] Wehby GL, Murray JC. Folic acid and orofacial clefts: a review of the evidence. Oral Dis. 2010;16:11-19. PMid:20331806 PMCid:2922396. http:// dx.doi.org/10.1111/j.1601-0825.2009.01587.x

[8] Wu T, Liang KY, Hetmanski JB, Ruczinski I, Fallin MD, Ingersoll RG, et al. Evidence of gene-environment interaction for the IRF6 gene and maternal multivitamin supplementation in controlling the risk of cleft lip with/without cleft palate. Hum Genet. 2010;128:401-410. http://dx.doi.org/10.1007/s00439-010-0863-y

[9] Golalipour MJ, Kaviany N, Qorbani M, Mobasheri E. Maternal risk factors for oral clefts: a case-control study. Iran J Otorhinolaryngol 2012;24(69):187–192.

[10] Bille C, Skytthe A, Vach W, Knudsen LB, Andersen AM, Murray JC, et al. Parent's age and the risk of oral clefts. Epidemiology 2005;16(3):311-316.

[11] Millacura N, Pardo R, Cifuentes L, Suazo J. Effects of folic acid fortification on orofacial clefts prevalence: a meta-analysis. Public Health Nutr 2017;20(12):2260–2268.

[12] Badovinac RL, Werler MM, Williams PL, Kelsey KT, Hayes C. Folic acid–containing supplement consumption during pregnancy and risk for oral clefts: A meta-analysis. Birth Defects Res Part A Clin Mol Teratol 2007;79(1):8–15.

[13] Wyszynski DF, Sarkozi A, Vargha P, Czeizel AE. Birth weight and gestational age of newborns with cleft lip with or without cleft palate and with isolated cleft palate. J Clin Pediatr Dent. 2003;27(2):185–190.

[14] Tamburini ABF, Barros LM, Paranaiba LMR, Bonan PRF, Politano GT, Martelli DRB, et al. Risk factors associated with nonsyndromic oral clefs in a Brazilian population: a case-control study. Rev Odontol 2012;41(3):201–208.
[15] Bui AH, Ayub A, Ahmed MK, Taioli E, Taub PJ. Association Between Cleft Lip and/or Cleft Palate and Family History of Cancer. Ann Plast Surg. 2018 Jan;1.
[16] Jajja MRN, Gilani A, Cawasji ZF, Imran S, Khan MS, Hashmi SS, et al. Oral clefts: a review of the cases and our experience at a single institution. J Pak Med Assoc 2013;63(9):1098–1102.
[17] Puhó EH, Szunyogh M, Métneki J, Czeizel AE. Drug Treatment during Pregnancy and Isolated Orofacial Clefts in Hungary. Cleft Palate-Craniofacial J 2007;44(2):194–202.
[18] Salihu S, Krasniqi B, Sejfija O, Heta N, Salihaj N, Geci A, et al. Analysis of Potential Oral Cleft Risk Factors in the Kosovo Population. Int Surg. 2014 Mar;99(2):161–165.
[19] Goveas SR. Role of Environmental Factors in the Etiology of Non-syndromic Cleft Lip Palate. Int J Sci Stud 2017;4(12):12–25.
[20] Krapels IPC, van Rooij IALM, Ocké MC, West CE, van der Horst CMAM, Steegers-Theunissen RPM. Maternal Nutritional Status and the Risk for Orofacial Cleft Offspring in Humans. J Nutr. 2004;134(11):3106–3113.
[21] Lakshmikantha G, Singh N. Assessment of maternal risk factors in neonates with cleft lip palate in rural India. Int J Obstet Gynaecol. 2018;2(5):81–83.
[22] Xuan Z, Zhongpeng Y, Yanjun G, Jiaqi D, Yuchi Z, Bing S, et al. Maternal active smoking and risk of oral clefts: a meta-analysis. Oral Surg Oral Med Oral Pathol Oral Radiol. 2016;122(6):680–690.
[23] Lie RT, Wilcox AJ, Taylor J, Gjessing HK, Saugstad OD, Aabyholm F, et al. Maternal Smoking and Oral Clefts. Epidemiology. 2008;19(4):606–615.
[24] Kummet CM, Moreno LM, Wilcox AJ, Romitti PA, DeRoo LA, Munger RG, et al. Passive Smoke Exposure as a Risk Factor for Oral Clefts—A Large International Population-Based Study. Am J Epidemiol 2016;183(9):834–841.
[25] Lim H, Beasley CW, Whitehead LW, Emery RJ, Agopian AJ, Langlois PH, et al. Maternal exposure to radiographic exams and major structural birth defects. Birth Defects Res Part A Clin Mol Teratol 2016;106(7):563–572.