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Assessment of maternal risk factors in neonates with cleft lip palate in rural India

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Abstract
Objective: To assess the maternal risk factors in cleft lip and/or palate**.**
Methods: All mothers who delivered babies from September 2011 to august 2016 with cleft lip palate were included in the study. Risk factors like maternal religion, age, socioeconomic status, parity, consanguinity, smoking either active and/or passive, infections during first trimester of pregnancy, any teratogen used in first trimester of pregnancy, folic acid intake during first trimester, pre pregnant BMI or first trimester BMI and Hemoglobin status in first trimester were evaluated.
Results: 59 mothers were enrolled for this study. 91% were aged below 30 years, 67% were belonging to low socioeconomic status, 34% had consanguineous marriage, 10% were exposed for smoking, 91.5% were anemic.
Conclusion: In our study anaemia is the most important risk factor followed by low socioeconomic status for cleft lip and /or palate which if modified will significantly reduce this malformation.

Keywords: maternal risk factors, cleft lip, cleft palate, anaemia

Introduction
Congenital malformation is defined as a structural or chromosomal malformation with a significant impact on the health and development of a child [1]. The most common craniofacial abnormality being cleft lip and /or palate [2]. This condition has significant psychological and socioeconomic effects on quality of life and require multidisciplinary team approach for management. The complex interplay between genetic and environmental factors play a significant role in the cause of clefting. There are various risk factors like smoking, folic acid deficiency, obesity and racial variations. Some factors like teenage pregnancy, elderly gravid, malnutrition, consanguinity and teratogen intake during pregnancy has not been well correlated by controlled studies [3, 4]. Risk factors that can be modified will go a longway in preventing this condition. Hence this study has been conducted to find out the maternal risk factors of new born with facial cleft lip and / or palate.

Methodology
This study was conducted in the department of Obstetrics and Gynaecology from September 2011 to August 2016. Ethical committee approval was obtained. After obtaining consent all mothers who delivered babies with cleft lip and / or cleft palate were enrolled for this study. Risk factors like maternal religion, age, socioeconomic status, parity, consanguinity, smoking either active and/or passive, infections during first trimester of pregnancy, any teratogen used in first trimester of pregnancy, folic acid intake during first trimester, pre pregnant BMI or first trimester BMI and Hemoglobin status in first trimester were evaluated.

Results
Total number of births between 2011 and 2016 was 77,667. 59 neonates were found to have cleft lip and / or palate as shown in table 1. The incidence of this condition in our study was 7.6/10,000 births which is comparable with worldwide incidence. All the 59 mothers were enrolled in this study. Out of 59, 53(89.8%) were Hindus and 6(10.2%) were Muslims. Age less than 30 years were 54 women (91%) and more than 30 years were 5 women (9%). Low socioeconomic status was found to be associated more with facial cleft lip palate in our study as shown in table 2. Primipara were 49% and multipara were 51 %. Consanguinity was seen in 34% with either 3 degree or 2 degree out of which 90% had 3 degree consanguineous marriage and 10% non consanguineous marriage.

In our study only 6 patients (10.2%) were exposed for passive smoking. None of them were exposed for active smoking. During first trimester of pregnancy 4 women suffered from upper respiratory infections and 3 from urinary tract infections. All these women received a short course of amoxicillin. 50 women received folic acid in first trimester and only 9 had not received it. Normal BMI was seen in 46 women, overweight in 7, malnutrition in 3 and obesity in 3 women. However these are not statistically significant. In our study anaemia (Hb less than 11g %) was seen in 54 (91.5 %) women which was statistically significant.

Table 1: Different types of Oro facial clefts in our study.

Cleft type	No.	%
Cleft lip	14	23.7%
Cleft lip + palate	38	64.4%
Cleft palate	07	11.9%
Total	59	100%

Table 2: Association of socioeconomic status with cleft lip palate.

Socioeconomic status	Shinie Razol Goveas *et al.* [5] study (%)	Present study %
upper	-	-
Upper middle	2.4	3
middle	38	30
Upper lower	58	54
lower	1.6	13

Discussion

Cleft lip and palate is a major developmental deformity and occurs 1 in 500 -2500 live births depending on ancestry, geographic location, maternal age, prenatal exposures and socioeconomic status [6, 7]. There are various types of cleft lip and palate. More than 60% of Oro facial clefts involve the lip. Isolated cleft lip alone accounts for 10-30% and isolated cleft palate in 30-45% of cases [8, 9]. Although the repair can be done it is a burden and stigma to the family. There are various risk factors involved in this condition. The modifiable and non modifiable risk factors are shown in table 3. We found only one case with hypertension in pregnancy which was statistically not significant. The common association found in most of the studies is with smoking and folic acid deficiency [10, 11, 12]. However Natsume N *et al* study claims that there is no clear correlation of risk factors with cleft lip and palate [13]. Table 4 shows the comparison of risk factors with Rajesh P *et al* study and the present study. Shinie Razol Goveas *et al* assessed various geographic, racial and ethnic groups and found the relation of these risk factors in association with cleft lip and palate. Anaemia has been contributing to this condition as shown by Karoon Agrawal study [15] which is comparable to the present study. Anaemia and low socioeconomic status run parallel and as our hospital caters mainly to the poor these two risk factors are commonly seen in our study. However these modifiable risk factors if modified may go a long way in reducing this condition.

Table 3: Risk factors for cleft lip palate.

Modifiable risk factors	Non modifiable risk factors
Smoking Anaemia Diabetes Hypertension Alcohol consumption Age at conception Folic acid deficiency Teratogens.	Race/ ethnicity Genetic polymorphisms

Table 4: Comparison of risk factors associated with cleft lip palate.

Risk factors	Rajesh P *et al.* [14] (total 48)		Present study (total 59)	
	number	%	number	%
Primipara	21	43	29	49
multipara	27	56	30	51
consanguinity	16	33	39	66
Drug intake	3	6	7	12
Religion Hindu	43	89	53	90
Muslim	5	11	6	10

Conclusion

In our study anaemia is the most important risk factor followed by low socioeconomic status for cleft lip and /or palate which if modified May significantly reduce this malformation. Although many risk factors have been identified by other studies, our study has shown no other statistically significant risk factor. However larger randomized case control studies are required to conclude this.

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