

A retrospective hospital based study on factors influencing the incidence of cleft lip and palate cases in Bihar region

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Abstract

Introduction: Cleft lip and palate are most common developmental anomaly of head and neck region affecting a great number of newborns worldwide. Further it gives rise to psychosocial and financial strain to the affected family especially in developing countries like India. The exact etiology and pathogenesis of cleft lip and palate is still an enigma and behave as a complex process involving several genetic and environmental factors.

Objective: To assess the pattern of cleft lip and palate cases and to analyze if any relation to environmental factors present in Bihar region.

Materials and Methods: This retrospective study was conducted in Government Hospital of Patna, Bihar through evaluating the recorded medical files of cleft lip and palate cases of 5 years duration and self designed data forms were filled.

Results: Results were obtained through analyzing the obtained data and were tabulated. Percentage and frequency was evaluated to assess the pattern of incidence of such anomalies.

Conclusion: The present study is in favor of conceptualization of multifactorial theory involved in occurrence of cleft lip and palate. Furthermore, it also provides a baseline data for future reference which might help in conducting any researches on this particular area.

Keywords: Cleft lip, Cleft palate, Factors, Incidence, Retrospective.

Introduction

Congenital craniofacial anomalies like cleft lip and palate are among one of the major health concern issues worldwide. Even since long ago World Health Organisation (WHO) has started its own surveys all over the world to analyze the data of such cases and how differently they occur in various countries.¹ India is among one of the countries in the world where due to lack of national registry of birth defects, the exact estimation of prevalence of such cases is not easy to obtain as major source of information are either hospital based surveys or studies. Birth defects commonly include neural tube defects and orofacial clefts (further divided into cleft lip with or without cleft palate and cleft palate only).²

Apart from the complex deformities of nose, lips, alveolus or palate involved in cleft lip and palate, psychosocial and financial strain is additionally causing trauma to the affected family especially in developing countries like India.^{3,4} The exact etiology and pathogenesis of cleft lip and palate is still an enigma and behave as a complex process involving several genetic/ hereditary and environmental factors. Aside from family history of clefts, here are number of environmental factors which can affect the incidence of such cases like to begin with stress, smoking, alcohol ingestion, use of any kind of medication during pregnancy, maternal obesity and overweight, deficient folic acid intake in the pregestational period and during first trimester of pregnancy, history of miscarriage and/or stillbirth which directly or indirectly influence the incidence of such cases.⁵⁻⁷ Indian sub- continent have large number of cleft lip and palate cases but studies show inconsistent results which may be attributed to at first place

geographical variation, method of data collection and pattern of study design.³

Looking at the paucity of studies correlating the incidence of cleft lip and palate with possible etiological factors in Bihar population, the present retrospective study was conducted to assess the pattern of cleft lip and palate cases and to analyze if any relation to environmental factors present in Bihar region.

Materials and Methods

This retrospective study was conducted in Government Hospital of Patna, Bihar through evaluating the recorded medical files of cleft lip and palate cases of 5 years duration that admitted directly or came as referral patient for rehabilitation and self designed data forms were filled after the extraction of related information.

Results

A total of 48 cases of cleft lip and palate were included in the study which had complete history as per needed by our data. Incomplete history cases were excluded in our study, therefore exact incidence of such cases was not calculated. Syndrome associated clefts were excluded from the study. Table 1 demonstrates the distribution of cleft types. Selected cases were analyzed according to the variables included in the study and formulated in table 2.

Table 1: Distribution subjects among cleft types

Type of cleft	Number	Percentage
Cleft lip	12	25%
Cleft lip + palate	31	64.58%
Cleft palate	05	10.42%
Total	48	100%

Table 2: Distribution of subjects among reliable factors in self designed data

S. No.	Reliable Factors
1.	Infant gender- Male (26)/ Female(22)
2.	Child's birth order in family- First (24)/ Second (15)/ Third or higher (09)
3.	Religion- Hindu (22) / Muslim (26)
4.	Mother's age at the time of pregnancy- <30 years (42)/ >30 years (06)
5.	Mother's Habit – Smoking (08)/ Alcohol (00)/ Both (00)/ None (40)
6.	Father's Habit – Smoking (42)/ Alcohol (46)/ Both (42)/ None (02)
7.	Mother's history of stress- Present (39)/ Absent (09)
8.	Medications taken during pregnancy- Taken(12)/ Not taken(15)/ Not remember (21)
9.	Folic acid supplementation- Positive (08)/ Negative (40)
11.	Any history of previous abortion/miscarriage- Present (14)/ Absent (34)
12.	Consanguineous marriage- Present (18)/ Absent (30)
13.	Familial history- Present (12)/ Absent (36)

Discussion

Indian being a diverse geographic sub continent therefore, its demographic and clinical profile of the clefts cases differs from area to area.¹ We have taken into consideration Bihar population for the present study. Total 48 cases of cleft lip and palate were included in the study. In the present study frequency of combined cleft lip and palate is highest followed by cleft lip than cleft palate. Similar results were also shown by study done in South Indian population.^{8,10} Parihar et al in a study of Gujrat population showed higher incidence of combined cleft lip and palate followed by cleft palate.⁹ Even Khajanchi et al found highest cases of cleft lip followed by combined clefts in Gujrat population.¹¹ This variation in incidences could be attributed to diversities of the region. Clefts are polygenic in nature and considered as outcome of multiple factors involving environmental and hereditary. It is significant to provide any information regarding their correlation which definitely can improve the treatment plan and reduction of such cases.⁶ Our study considered many variables and tried to find correlation with the incidences of clefts. In the present study males with clefts were more than females, but as the total number is not significant we cannot comment upon the gender distribution of clefts in particular region. Desai et al presented with similar findings in Gujrat population whereas Praveen et al got more number of female clefts patients in Karnataka population.^{6,8}

The neonates with oral clefts were generally the first (almost 50%) followed by second and third children of the family in our study. Similar results were obtained in Iranian studies,^{5,12} but USA have reported that the prevalence of these disorders is higher during second time of pregnancy.¹³ The reason being the USA is developed country and there age of marriage is late, so, the age during second pregnancy may be considered as an influential factor.

Muslim religion was more affected than Hindu as per data of our study. The mother's age in majority was less than 30 years (87.5%) as most of them belong to lower socio-economic status, therefore results were not significant related to age factor. Whereas Habib suggested the fact that incidence of the clefts probably increases with mother's age as also suggested in many kinds of syndrome associated

factors.¹⁴ Praveen et al presented with similar findings as our study in Karnataka.⁸ 40 (83%) mothers were not having any kind of habit during their pregnancy and only 08 (16%) smoked bidi during that period. Only 02(4%) fathers were not having any kind of habit, other wise 46(96%) were involved in either smoking or alcohol consumption. Here, we suggest that even Father's habit can play a role in the incidences of clefts cases. Nehra et al also proposed that active and passive smoking during the first trimester of pregnancy resulted in an increased frequency of clefts.¹⁵

Maximum number of mothers (81%) was having emotional or mental stress during the pregnancy. Similarly, Parihar et al got higher emotional stresses in mothers during first trimester of pregnancy.⁹ Even study done in Finland; suggested severe emotional/mental stress during pregnancy is associated with increased incidence of clefts.¹⁷

Only 12 (25%) females took some medications during pregnancy, surprisingly they were not aware about type of drug they have consumed. 21 females (44%) does not remember if they have consumed some kind of medications. However these data does not show any accountability as the detailing could not be extracted from the written Performa's.

Out of 48 only 8 females (17%) showed history of folic acid supplementation during first trimester of pregnancy, but majority were not taken it regularly as prescribed. Rest 40 females (83%) were not aware of any such kind of supplementation to be consumed. There are proven results which stated that folic acid has a definite role in the prevention of oro-facial clefts.¹⁷

In our study, 14 mothers (29%) had a history of previous abortion/ miscarriage, which is definitely a matter of concern here. About 18 parents (37.5%) had a consanguineous marriage in the present study, which all belong to Muslim community. Many studies have found significant correlation of children with clefts being born to parents of consanguineous marriage and consanguinity is a considered as one of the major risk factor for oro- facial clefts.^{5,6} The present study showed that 12 out of 48 (25%) had a positive family history of clefts. Several other studies also showed strong correlation of familial history with incidences of clefts cases.^{5,6,9} The results of the present study are in favor of conceptualization of multifactorial

theory involved in occurrence of cleft lip and palate. Furthermore, it also provides a baseline data for future reference which might help in conducting any researches on this particular area.

Conclusion

The present study is an attempt to provide baseline information regarding the concept of multifactorial causation of cleft lip and palate in Bihar region. The scope of the present study was limited, but, there is definitive need to create general awareness which can be done by government by designing certain programmes/strategies to guide patients regarding this issue and its causative factors.

Source of Funding

None.

Conflict of Interest

None.

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