

SOCIO-ECONOMIC AND CULTURAL BACKGROUND OF PARENTS WITH NON-SYNDROMIC CLEFT LIP AND /OR PALATE CHILDREN IN NORTHERN NIGERIA

*H.O. OLASOJI, FMCDS

** O.O. ADEOSUN, FMCDS

*** A.O. ADESINA, BcHD

ABSTRACT

To establish possible association between the socio-economic status of parents and the risk of having a child with cleft lip and /or palate (CL/P) in northeastern Nigeria, a case-control study was done. A self-administered questionnaire was used to assess the socio-economic class of parents with CL I P children. Study was carried out at the University of Maiduguri Teaching Hospital, the only tertiary health Institution in northeastern Nigeria. Parents of 65 consecutive patients with CL/P attended the Oral and maxillofacial clinics of this health institution over a 3-years period. For each case, a set of parent with no history of malformed child was selected and matched for ethnic group, maternal age and parity. There was a statistical significant difference between the control and the cases based on socioeconomic status. When the low and the high socioeconomic groups were considered, a significant difference was also noticed amongst the cases and controls. It is suggested that a possible association exists between the socio-economic status of parents and the risk of having a child with CL/P in Northern Nigeria. An insight into the aetiology of CL/P, especially identifying environmental factors that place a family at risk in a locality should pave the way for preventive programmes in that area.

Key words: Socioeconomic status. Parents, Children. Cleft lip and palate.

INTRODUCTION

Cleft lip and/or (CL/P) with a frequency of approximately 1 in 1000 Caucasian births, is one of the most common orofacial congenital malformations.^{1,2} Its frequency varies among different populations. In 75% of cases the cleft lip is known to be unilateral, more common on the left, and in two third of cases the cleft lip is associated with a cleft palate.¹ It is twice as common in male fetuses.¹ Several methods of surgical

repair of orofacial clefts have been described in the medical literature.^{4,5}

Despite decades of intensive investigation into the cause of this birth defect, the pathogenesis is still not clear, however major population studies of facial clefts have identified that both genetic and environmental factors are involved in its aetiology.³ Falconer (1965)⁶ established the multifactorial threshold theory as an attempt to explain the aetiology of clefting. The theory

* Chief Consultant. Dept of Oral and maxillofacial Surgery, University of Maiduguri Teaching Hospital [Maiduguri. Nigeria. Soji273@yahoo.com](mailto:Soji273@yahoo.com)

** Senior Registrar, Dept of Oral and Maxillofacial Surgery, University of Maiduguri Teaching Hospital Maiduguri. Nigeria.

** * Registrar, Dept of Oral and Maxillofacial Surgery, University of Maiduguri Teaching Hospital, Maiduguri, Nigeria.

Correspondence Address: Dr. H.O. Olasoji, Dept of Oral and Maxillofacial Surgery, University of Maiduguri Teaching Hospital, P.M.B.. 1414. Maiduguri. Borno State, [Nigeria. Soji273@yahoo.com](mailto:Soji273@yahoo.com)

proposes that clefting is directly related to hereditary and environmental factors involved in the development and growth processes. Greater number of risk factors increase the probability of clefting and each case represent a combined liability or summation of risk factors. The precise meaning of the term threshold remain poorly understood, however, researchers have identified that various exogenous pharmacologic and environmental factors are associated with clefting. A California study reported that women over 39 years of age are twice as likely as those 25 to 29 years old to have a child with oral cleft.⁷ Smithless (1976)⁸ also found an association between CL/P and maternal anti-convulsant therapy. A significant increase rate of smoking among women who gave birth to infants with CL/P had also been established.⁹ In an earlier study on the influence of environmental teratogenic factors (petroleum, oil wells and gas flares) on the incidence of clefts in southeast Nigeria, Datubo (1989)¹⁰ concluded that there was no proof of cause and effect relationship between deformities and industrial pollution.

We made a case-control study to establish possible association between the socio-economic status of parents and the risk of having a child with oral cleft in northeastern Nigeria.

PATIENTS AND METHODS

The study composed of parents of 65 Nigerian children with non-syndromic orofacial clefts that attended the Oral and Maxillofacial clinics of the University of Maiduguri Teaching Hospital over a three-year period (from June 1999 to June 2002). This is the only referral centre that manages orofacial clefts in northeastern Nigeria comprising six states.¹¹ For each cleft case, set of control parent with no history of malformed child was selected in the clinic and matched for ethnic group, maternal age (5 year periods) and parity (I, 2, 3 to 4, 5+). All socio-economic cadres of the society are well represented in the hospital patient's population.¹² A self-administered questionnaire was used for demographic information and clinical documentation of all cleft cases in our clinic since 1994, however the following socio-economic and cultural information was added after a review of the format in May 1999; education attainment, occupation, marital status and family size of the parents. Parent's method of marriage and place of birth of the patients were also included.

Based on relevant data from questionnaire, parents of cleft cases and controls were grouped into two social classes (high socio-economic class and low socio-economic class) using the method and classification described by Oyedeji (1984).¹³ Socio-economic index scores were awarded to each child and the control based on the occupation and educational attainment of the parents. For occupation; class 1 was allocated to senior public servants, professionals, managers, large scale traders, businessmen and contractors; class 2 to intermediate grade public servants and senior school teachers; class 3 to junior school teachers, drivers and artisans; class 4 to petty traders, labourers, office messengers and class 5 to the unemployed, full time housewives, students and subsistence farmers.

For the educational scale, class 1 was awarded to university graduates or its equivalents; class 2 to school certificate (Ordinary Level GCE) holders who also had teaching or other professional training; class 3 to school certificate or grade II teachers certificate holders or its equivalents, class 4 to those who had modern three and primary school certificate and 5 to those who could either just read and write or were illiterate.

The mean of four scores (two for the father and two for the mother) to the nearest whole number, was the social class assigned to the cleft case and the control. For example, a father who is a University lecturer would score 1 for his occupation and 1 for his education as a graduate. If his wife is a businesswoman with a school certificate level of education, she would score 1 for her occupation and 3 for the education. The total of these four scores would be 6 with an average of 1.5; when taken to the nearest whole number, it would be 2. Thus the social class 11 would be assigned to the child. Social classes 1, 11 and 111 represent the high socio-economic class, while social classes IV and V represent the low socio-economic class.

Data were fed into IBM compatible computer and analyzed using the statistical software SPSS version 11. Significant differences were inferred at P-values less than 0.05.

RESULTS

The age of the 65 children with orofacial clefts studied in this report ranged from one day to six years;

34 females and 31 males. The site distribution of the clefts was: 34 (52.3%) cases of cleft lip only, 28 (43.1%) cleft lip and palate and 3 (4.6%) cases of cleft palate only. All the parents of the children with facial anomalies and the control were Northern Nigerians mainly from the Kanuri and Hausa ethnic groups. In 41 (63.1%) of the cleft cases, the parents were married under the traditional law and customs while 24 (36.9%) parents married in government registry. 39 (60%) of the marriages were polygamous and 26 (40%) monogamous; the number of wives in the former ranged from 2 to 4. 44 (67.7%) patients with CL/P were born in hospitals while 21 (32.3%) were delivered by traditional birth attendants either at home or in religious places.

The occupations of the parents of the cleft cases and the control are shown in Table 1. For the cleft cases, 14 (21.5%) and 13 (20%) fathers were labourers (in public

TABLE 1: DISTRIBUTION OF THE OCCUPATIONS OF PARENTS IN VARIOUS GROUPS

		Fathers Nos.		Mothers Nos.	
		Cases	Control subjects	Cases	Control subjects
1.	Labourers/messengers	14	2	3	2
2.	Farmers	13	2	2	0
3.	Large scale traders	12	9	0	5
4.	Contractors	0	6	0	1
5.	Petty traders	11	2	5	10
6.	Artisans	4	4	0	0
7.	Drivers	4	3	0	0
8.	Senior grade public servants	4	12	1	5
9.	Intermediate public servants	1	15	1	12
10.	Students	1	2	1	6
11.	Teachers	1	7	0	14
12.	Unemployed or full time housewives	0	1	51	10
	TOTAL	65	65	65	65

ministries) and farmers respectively and most of the mothers (n = 52, 80%) were full time housewives i.e unemployed. The farmers were mostly peasants engaged in subsistence farming while the petty traders sold assorted items in small quantities and belonged to the low-income group. Artisans (local carpenters, local tailors etc) were private or public employed workers in the low-income group. Only 4 (6.2%) fathers in the cleft group work as a senior grade public servant. In the control group, 15 (23.1%) fathers are intermediate public servants, 12 (18.5%) are employed as senior grade public servants and 9 (13.8%) are large scale traders. Only 10 (15.4%) mothers in the control group are unemployed while 55 (84.6%) are engaged in one form of occupation.

Table 2 shows the educational levels attained by the parents of the cleft cases and the controls. Majority of the fathers (n = 54, 83.1%) and mothers (n = 58, 89.2%) in the cleft group had no formal education while only 11 (16.9%) and 7 (10.8%) fathers and mothers respectively of the cleft cases had primary and secondary level of education. No parent with a cleft child had a university education. In the control group, 60 (92.3%)

TABLE 2: DISTRIBUTION OF THE EDUCATIONAL LEVELS ATTAINED BY THE PARENTS IN VARIOUS GROUPS

		Fathers Nos.		Mothers Nos.	
		Cases	Control subjects	Cases	Control subjects
1.	No formal education	54	5	58	7
2.	Primary six (first school leaving certificate	3	13	2	11
3.	West African School Certificate	5	9	4	12
4.	School certificate (GCE) plus teaching or other professional training	3	14	1	20
5.	University degree	0	24	0	15
	TOTAL	65	65	65	65

TABLE 3: SOCIO-ECONOMIC CLASS DISTRIBUTION IN CLEFT CASES AND CONTROL SUBJECTS.

Socio-economic groups	Cases Nos. (%)	Control subject Nos. (%)
*I	0	19(29.2)
**II	2(3.1)	18(27.7)
**III	3 (4.6)	10(15.4)
*IV	25 (38.5)	10(15.4)
*V	35 (53.8)	8(12.3)
TOTAL	65(100)	65(100)

** High socio-economic group = I, II and III

Low socio-economic group = IV and V

Chi square 56.54, df=1, P= 0.00

of the fathers and 58 (89%) of the mothers had at least one form of western education.

The socio-economic class distribution of the parents of the cleft cases and the control group is shown in Table 3. None of the parents of the cleft cases belong to the social class 1 compared to 19 (29.2%) in the control group. 2 (3.1%) parents of cleft cases and 18 (27.7%) in the control group were classified in social class II. 3 (4.6%) parents of the cases and 10 (18.5%) in the control were in social class III. Further analysis showed that 25 parents (38.5%) of the cleft cases and 10 (18.5%) of the control are in social class IV while and 35 (53.8%) of the cases and 8 (12.3%) of the control are in social class V. Thus 60 (92.3%) parents with cleft children were found in the low socio-economic class (social classes IV and V) compared to 18 (27.7%) in the control group. 5 (7.7%) parents of the cleft cases and 47 (72.3%) controls belong to the high socio-economic class (social class I, II and III). A statistical significant difference is seen between the controls and the cases based on their socioeconomic status: Chi square (X^2) = 58.95, df = 4, P = 0.00. When the low and the high socioeconomic groups were considered, a significant difference is also observed amongst cases and controls: Chi square = 56.54, df = 1, P = 0.00.

DISCUSSIONS

The aetiology of oral clefts is attributable partly to genetic and partly to environmental factors. The multifactorial threshold hypothesis established by Falconer (1965)⁶ claims further that the sum of the genetic factors places the developing embryo near the thresh-

old for clefting, and when this is coupled with any of a number of environmental factors, threshold may be surpassed and clefting occurs. There is ample epidemiological evidence that intrauterine pathologic events of environmental origin are involved in the mechanism of CL/P.¹⁴

Analysis of the data in the present report demonstrated a significantly increased rate of CL/P children among parents in the low socio-economic class. This observation is supported by a previous Finland study¹⁴, which inspired the present investigation. It thus seems reasonable to suggest that a positive association exists between the socio-economic status of a family and the risk of having a child with CL/P in northeastern Nigeria. Perhaps, this is not a direct causative correlation, but probably due to one or more confounding factors, one of which might be the maternal nutritional status. Habib (1978)¹⁵ was of the opinion that nutrition of a pregnant woman was probably the link between the social class and the incidence of CL/P. Studies have shown a high incidence of pregnancy associated anaemia in women in the low socioeconomic group in northeastern Nigeria: this was attributed to poverty and poor nutrition prevalent in the low income group.¹⁶ Under-nutrition in Nigeria low income earners is a long standing problem which has persisted since the 1960s and whose magnitude has decreased appreciably in this group of Nigerians, especially with the commencement of the structural adjustment programme (SAP) in 1986. Available studies from limited data have indicated that the introduction of economic reforms more than anything else has contributed to reduce food intake and near collapse of nutrition oriented health delivery services, most especially among the low socioeconomic group.¹⁷

When the women in the present study were interviewed on various possible harmful exposures during pregnancy, only few (3 cases and 2 controls) reported having smoked cigarettes during pregnancy in contrast to the findings in most of the developed countries.¹⁸ The low prevalence of cigarettes smoking among women in the present report may be due to the Islamic-culture in this environment. A relatively large number of women with CL/P children (39 cases and 7 controls) in this study, however, reported to have taken locally made medications on several occasions during early period of pregnancy. These traditional medications are usually

prepared from combinations of many plants extract to either treat suspected malaria parasitic infection which is known to be endemic in most African population¹⁹, or as a sedative to prolong sleeping period during the earlier period of pregnancy. This observation is in support of previous findings, where Nigerian pregnant women in the low income group who in most cases can not afford cost of antenatal care in government hospitals have been reported to routinely take medications prepared by traditional healers.^{19,20} The composition of this local medications could not be determined during this study, however further studies will be necessary to determine any possible teratogenic effect.

Oyedeki (1984)²¹ also observed that emotional stress associated with poverty is a common occurrence in pregnant women in the lower social class, especially in developing countries. Drillien et al., (1975)²¹ and Saxen (1974)¹⁴ in separate reports documented that emotional stress was more frequent among mothers of children with oral clefts. This was associated with overproduction of cortisone in such mothers. Excessive cortisone may be associated with teratogenic effect in early pregnancy.⁸ Since most studies on emotional stress are retrospective it seems reasonable to doubt their rel-

evance, however the possibility of an association between social class, emotional stress and the risk of having an infant with CL/P need to be further investigated. The effect of cultural factor such as polygamous families on the incidence of CL/P cannot be ascertained in this study.

It seems reasonable to suggest that a positive association exists between the socio-economic status of parents in northeastern Nigeria and the risk of having a child with cleft lip and/or palate. This, however may not be a direct causative correlation but due to one or more confounding factors. An insight into the aetiology of CL/P especially identifying possible environmental factors in a locality that could place a family at risk may perhaps pave the way for preventive programmes.

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