The Incidence of Cleft Lip and Palate in Nigeria

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The author examined 21,624 consecutive infants born at The University of Nigeria Teaching Hospital, Enugu, from 1976 to 1980. There were eight cases of clefts of the lip or palate or both giving an incidence of one in 2,703 live births.

A retrospective analysis of 360 cleft lip and palate patients during the same period showed a distribution which is at variance with other reported series. The frequency of cleft lip only was 49%, of cleft palate only was 19%, and of cleft lip and palate was 32%. Right and left-sided lip clefts occurred in equal proportions, although in complete clefts, left-sided lesions tended to predominate. A very slight male preponderance in cleft lip only was found, but there were an equal number of males and females in the other two groups. The proportion of adults with unoperated clefts was high. Associated congenital abnormalities occurred in 18% of the patients.

KEY WORDS: Epidemiology, Nigeria, associated congenital abnormalities

Although cleft lip and palate has been widely investigated, there is still a dearth of information on the black populations of Africa. Two previous African surveys have reported an incidence at birth of 1:689 (Simpkiss and Lowe, 1961), and 1:1055 (Gupta, 1969), but these were from small series in which several other congenital abnormalities were included. Oluwasanmi (1970) reviewed 128 cases with clefts treated at Ibadan.

Materials and Methods

Between 1976 and 1980 there were 21,624 infants born at The University of Nigeria Teaching Hospital, Enugu, and all were examined by the author for the presence of lip or palate clefts. The palate was examined for submucous clefting. The number examined was in excess of 20,000 regarded as acceptable by one World Health Organization study of congenital malformations in various countries (Stevenson et al, 1966).

In addition, information was obtained on 360 clinical patients regarding their date of birth, sex, type of clefts, parental age, villages of origin, and the presence of other congenital malformations. Mothers were asked about previous abortions and about their antenatal history, including illnesses and drugs taken in first trimester of pregnancy. Full information was not obtained in every instance.

Results

INCIDENCE. A total of eight clefts were noted among the 21,624 infants, giving an incidence of 1:2,703 live births. Table 1 compares this with the incidence for various other racial groups. Isolated cleft lip (four cases) had an incidence of 1:5,406 or 0.2/1000 births; isolated cleft palate (one case) an incidence of 1:21,624 or 0.05/1000 births; and cleft lip and palate (three cases) an incidence of 1:7,207 or 0.14/1000 births.

TYPE OF CLEFT. In the 360 clinical patients isolated cleft lip accounted for half, cleft palate one fifth and cleft lip and palate for two

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fifths (Table 2). Right and left-sided clefts tended to occur in almost equal proportions, 38% and 41% respectively (Table 3). A high incidence (10%) of median clefts was noted. When both lip and palate were involved, there was a marked predilection for the left side as noted by other authors.

SEX. There was a very slight excess of males with cleft lip, the ratio of males to females being 1.1:1. However, in isolated cleft palate and clefts of both lip and palate, an equal incidence between the sexes was found (Table 4). These figures agree in part with those of Oluwasanmi who found equal ratios of cleft lip and cleft palate in boys and girls in Nigeria, (Oluwasanmi, 1970), but contrasts with most Caucasian series in which clefts of the palate were found to occur more frequently in females.

TABLE 1. Racial Incidence

Race	*Date*	*Author*	*Incidence*
Japanese	1958	Neel	1:373
Caucasian	1953	MacMahon & McKeown	1:600
	1971	Fogh-Andersen	1:500
New World Negro	1963	Althemus (America)	1:2,218
	1965	Millard & McNeil (Jamaica)	1:1,887
African Negro	1981	Ireceulem (Nigeria)	1:2,703

TABLE 2. Type of Clefts

Author	*CL*	*CP*	*CLP*
Fogh-Andersen (1942)	25%	25%	50%
Fraser & Calnan (1961)	20%	46%	24%
Iregbulem (1981)	49%	19%	32%

CL = Cleft Lip, CP = Cleft Palate, CLP = Cleft Lip & Palate.

TABLE 3. Laterality of Clefts

Type of Cleft	*Right*	*Left*	*Bilateral*	*Median*
CL	38%	41%	11%	10%
(176)	(67)	(72)	(19)	(18)
CLP	20%	39%	41%	—
(116)	(23)	(45)	(48)	—

TABLE 4. Sex Incidence.

Author	*Type*	*Male Female Ratio*
Fogh-Andersen (1942)	CL	M > F
	CP	M > F
	CLP	F > M
Knox & Braithwaite (1963)	CL	M > F (1.6:1)
	CP	F > M (1:0.7)
	CLP	M > F (2.1:1)
Iregbulem (1981)	CL	M F (1.1:1)
	CP	M = F (1:1)
	CLP	M = F (1:1)

SEASONAL INCIDENCE. Accurate dates of birth were obtained in 288 patients (Table 5). For cleft lip and cleft lip and palate, more of the affected children were born in March and September. However, in the absence of any accurate control data, such as the Registar General's report on births, statistical evaluation of these observations cannot be made.

AGE OF PRESENTATION FOR SURGERY. Of the 332 patients whose ages were known, about one half (49%) were seen within the first three months after birth, 20% within 3–12 months, and 17% between 1 and 12 years. Adult with unoperated clefts accounted for 14% of all cases.

PARENTAL AGE. This did not appear to be a significant factor in the genesis of the type of cleft lip or palate. In Nigeria most adults, especially among the low income group, are uncertain of their ages, and so parents were grouped according to their age decades (e.g. 20–29 years, 30–39 years, etc.). A total of 119 couples was thus available. All groups of clefts were looked at separately but the widely held view that fathers of cleft lip and palate children were older than expected (Wolfe, C.M., 1963., Fraser & Calnan, 1961) could not be substantiated.

FAMILY HISTORY. In 18 of 314 patients (6%) there was a positive history of clefting. In two families, consecutive pregnancies within three years had produced children with similar cleft lip and palate malformations. In one, both girls had right unilateral cleft lip (Figure 1). In the other, the first child with bilateral cleft lip and palate had died shortly after birth, but the second, also with bilateral cleft lip and palate had survived. In 16 out of 18 cases where the family history was positive, the affected relative was a female. There were no twins in the series.

ASSOCIATED CONGENITAL MALFORMATIONS. A list of associated congenital malformations

TABLE 5. Seasonal Incidence (228 Patients.)

	Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*Jul.*	*Aug.*	*Sep.*	*Oct.*	*Nov.*	*Dec.*
CL	5	12	18	—	5	5	12	12	17	11	12	10
CP	—	8	5	6	—	3	2	3	3	5	3	8
CLP	13	3	16	17	5	13	12	11	14	5	5	8
Total	18	23	39	23	10	21	26	26	34	21	21	26

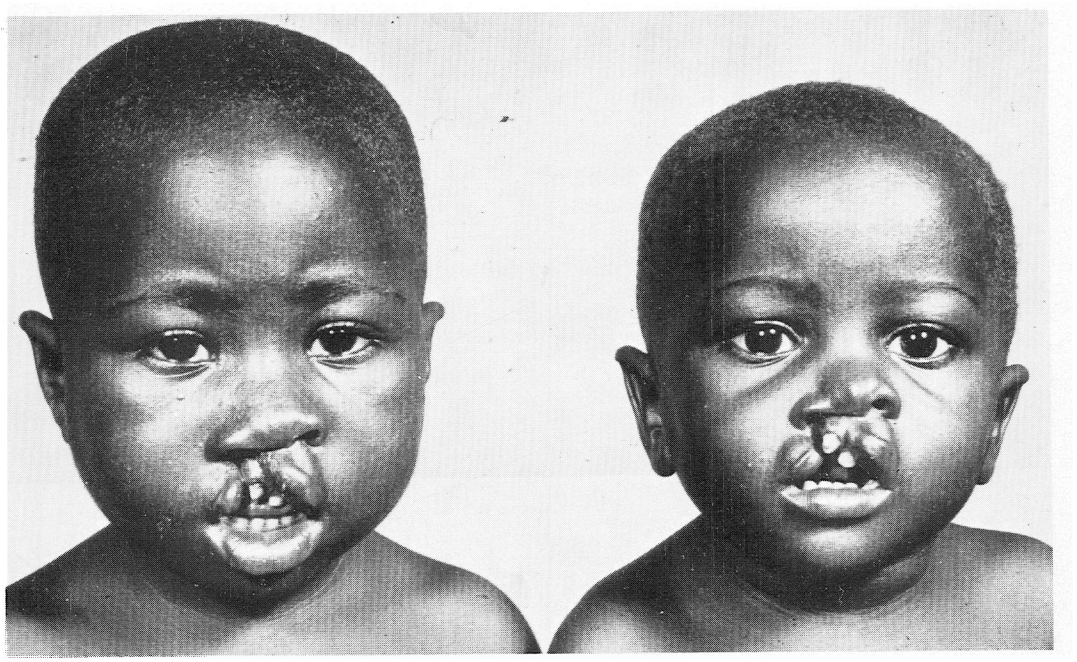

FIGURE 1. Two sisters aged 18 and 30 months with right unilateral cleft lip.

is shown in Table 6. Sixty-five malformations occurred in 360 patients. Various estimates for these range from 20% (McKeown & Record, 1960) to 10% (Fraser & Calnan, 1961). It seems probable that babies born with the more severe congenital anomalies, especially those involving the cardiovascular and central nervous systems died before referral to hospital; hence the absence of such anomalies.

BIRTH ORDER. Miscarriages and still births were included in determining the order. The result of this inquiry is tabulated in Table 7. Nigerian families have an average of six children.

ENVIRONMENTAL FACTORS. It is possible that many "fertility drugs" administered by traditional herbalists in Nigeria contain terato-

TABLE 6. Associated Congenital Abnormalities.

Abnormalities	*CL*	*CP*	*CLP*
Eyelid Coloboma	—	6	3
Metatarsus Adductus	—	2	—
Acrocephalosyndactyly	—	6	—
Ankyloglossia	3	—	4
'Bat' Ears	3	6	—
Hypospadias	4	4	—
Congenital Ptosis	2	3	—
Talipes	—	3	—
Inguinal Hernia	4	1	—
Accessory Auricles	—	3	—
Congenital Cataract	2	—	—
Polydactyly	—	4	—
6 G.P. Deficiency	—	—	2
Totals	18	38	9

TABLE 7. Birth Order.

Birth Rank	*Number of Affected Children*	*Percentage (%)*
1	84	24.3
2	40	11.6
3	70	20.2
4	42	12.1
5	44	12.7
6	29	8.4
7	16	4.6
8	13	3.8
9	0	0
10	8	2.3
Total	346	100.0

gens. However, only 10% of the women in the present study admitted to having taken such drugs; the majority had received antenatal care in an obstetric unit where drugs like folic acid, iron and vitamins were routinely administered in recommended doses. Three women who admitted to a pyrexial illness during the first trimester had been treated successfully with chloroquine which is generally regarded as a safe drug.

There was no concentration of children with cleft lip or palate deformity in any particular village. Further tests for clustering in space and time were therefore not performed.

Past obstetric history was obtained in the mothers of 291 of our cleft patients. In 39 of these women, maternally recognized abortion (usually in the first trimester) preceded the birth of the affected child, an incidence of about 13%.

Discussion

The relative infrequency of cleft lip and palate malformations in the black populations of Africa and the New World is now generally accepted. The low incidence of 1:2,703 in the present series would appear to confirm this observation. Various factors which militate against the propagation of clefts, such as high perinatal mortality from malnutrition, disease and infanticide, may be largely responsible for the low incidence. Another factor, not previously realized, is the extremely low incidence of consanguineous marriages among Nigerians. It is virtually impossible for one to marry a cousin no matter how far removed. As a consequence, the possibility of summation of any genetic traits is extremely remote.

The relatively greater frequency of cleft lip and palate in the New World Negroes as compared with the Nigerian could be explained by the higher prevalence rate of mixed marriages in those countries, the absence of infanticide, and the lower perinatal mortality.

In published Caucasian series an approximate distribution of clefts would be: isolated clefts of the lip-25%, cleft palate-25% and cleft lip and palate-50%. The present study shows a high percentage (49%) of isolated cleft lip which is not surprising since this is the group most compatible with survival. The low percentage of cleft palate (19%) in Nigerians, however, contrasts sharply with the 50% figure for the American Negro (Altemus, 1966). In Nigeria, however, cleft palate is more often associated with other congenital abnormalities and there is a high perinatal mortality. The incidence of cleft lip and palate (32%) was understandably lower than in the Caucasian series for similar reasons.

Cleft lip and palate and isolated cleft palate are now generally regarded as genetically distinct entities. This distinction was confirmed in this study. The equality in the sex ratios (apart for the very slight excess of males in cleft lip alone) probably suggests that both males and females are equally susceptible to possible multifactorial genetic and environmental factors.

The role of drugs acting as teratogens may be negligible, even though in Nigeria most drugs can be purchased across the counter by the public without prescriptions. Self-medication is a common practice even among pregnant women in the rural areas. These women are also subjected to intense family pressures that compel them to take several local herbs and concoctions which have unpredictable pharmacological actions. In spite of all these potential hazards, the incidence of cleft lip and palate remains exceedingly low.

As already noted, the highest number of children with clefts were born in March and September. If the last menstrual period (LMP) is calculated by counting back nine months (Czeizel & Elek, 1967) then births in March and September correspond to LMP in June and December. It would be interesting to speculate on the possible relationship between the increased incidences of clefts during

those months. In Nigeria, the heaviest rainfall occurs in June and July. As untreated rainwater is the most common source of drinking water in many parts of rural Nigeria large amounts of dissolved heavy metals and pollutants could be incriminated as possible teratogens. Also in many parts of the country, the markets are flooded with newly harvested food crops in June and July. Popular among these is the yam tuber. In some Nigerian tribes, folklore forbids pregnant women from eating "new" yams because of the possible effects on the fetus. December is the height of the dry season and the peak of the viral exanthemata especially measles. Since it is well known that viral infections can cause spontaneous abortions and even fetal death, it is possible that some damaged fetuses may proceed to term with various congenital defects like cleft lip and palate compatible with survival.

In the absence of adequate control data, the significance of the 13% incidence of antecedent abortion is difficult to evaluate, and the question of the possible relationship between embryonic death and cleft lip and/or palate liability must await future collection of adequate data.

The failure to obtain a positive family history in 94% of the cases should be treated with caution because the social taboos attached to such an obvious congenital deformity as cleft lip or palate is exceedingly strong. Hence most families deny the existence of such a congenital defect in any of its members. However, society is also fickle in this country; no sooner were the adult females with clefts repaired than they were married. Three in the present series returned to the follow-up clinic, three months after operation, already engaged to be married, presumably because of their improved appearance. It is thus theoretically possible that the incidence of cleft lip and palate in Nigeria will increase in the next generation because of the onward propagation of the genetic trait, and the anticipated increase in survival of the new born.

The high proportion of adults with clefts may result from socio-economic factors. Facilities are limited and overstretched. The author's unit, for instance, serves a catchment area with a population of more than 20 million people. In practice, this means that only about 1% of all clefts seen within 3 months of birth can be operated upon within that period generally recommended as optimal. Consequently, most clefts come to surgical repair with severe secondary deformities which make the operation difficult and tedious.

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