ORIGINAL RESEARCH

A hospital-based retrospective study on the prevalence and pattern of cleft lip, cleft palate, and combined cleft lip and palate in Zimbabwe, January 1981 through December 1999

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Abstract

Background
Nonsyndromic cleft lip (CL), cleft lip and palate (CLP), and isolated cleft palate (CP) are the most common congenital anomalies of the orofacial region. The scarcity of data on the epidemiology of CL, CLP, and CP in Zimbabwe are limited to allow for development of policies on management and public education on these conditions. The aim of this study was to determine the prevalence, pattern, regional distribution, hospital stay after surgery, age at time of treatment and complications in Zimbabwe of patients with CL, CLP, CP and compare with similar results in the literature.

Methods
A retrospective study of 405 patients with CL, CLP and CP treated in two tertiary hospitals in Harare, Zimbabwe. Data was retrieved from hospital records of the patients and analysed using STATA 8.4.

Results
There were 49.8% males and 50.3% females. Most patients came from the Harare province (33.7%).CL was the most common anomaly (56%) with male preponderance (60.8%); CP was the second most common anomaly (40.8%), with female preponderance (45.8%); CLP was least common (3.3%) ,affecting 3.5% males and 3.3% females. Average age at the time of treatment for children was 9 months for CL, 12 months for CLP and 24 months for CP and in adults the average age was 21 years for CL, 33 years for CLP and 24 years for CP ; age range for patients who presented for surgery was 1 month to 60 years ; average hospital stay was 8.2 days ; complications recorded were infection (2.5%) and wound dehiscence (4%).

Conclusions
The study showed prevalence, gender distribution, pattern of clefts, and different pattern of distribution of the clefts within the country and complications rate similar to reports in the literature. However, there was a rather high CL prevalence, longer hospital stay and higher age at the time of treatment for both children and adults.

Keywords: cleft lip, cleft palate, Zimbabwe

Introduction

Non syndromic cleft lip and/or palate represent the most common congenital anomaly of the face, corresponding to approximately 65% of all malformations of the craniofacial region.[7],[27],[28] Orofacial clefts are the most common facial malformations in all populations and ethnic groups.[7] Studies have revealed a wide ethnic, racial and regional variations with regards to the incidence and prevalence of cleft lip and palate.[25],[26] The variations could be related to several differing environmental , socio-economic factors or maternal risk factors (vitamin use, nutrition, access to medical care, diseases in the mother, teratogenic effect of drugs during pregnancy, and lifestyle risk factors such as smoking or alcohol consumption) playing an etiologic role.[10],[20]

CLP is usually reported to be about twice as common as CL although some studies have reported an overall high prevalence of CL.[29],[32] In most published reports, CLP is more common than CL or CP alone with percentages as follows: 47% in Kuwait,[5] 60.2% in Nigeria,[3] and 54% in Sudan.[33]

There is variable gender predilection for CL, CLP and CP with reported male to female ratios of 1:1.1 in Nigeria,[1],[3] 1:1.1 in Uganda,[16] and 1:0.3 in Malawi.[22] Other studies have reported gender variation in the predilection of the different types of clefts: male preponderance has been reported for CL in Kenya[25] and in S. Africa female preponderance has been demonstrated for unilateral CLP.[13],[14] Studies from the USA, Kuwait ,Croatia and Nigeria showed female preponderance for CP.[2],[3] The literature shows that the age at the time of repair varies from 2 months to 36 years with a hospital stay of 1 to 15 days.[4]

Table 1. Distribution of the patients by province and registered births per province (Bulawayo included in Matabeleland north province)[a]

Province	n (%)	Registered births
Harare	135 (33.7)	346 295
Bulawayo	23 (5.7)	-
Manicaland	47 (11.7)	600 296
Masvingo	52 (13.0)	475 424
Midlands	23 (5.7)	468 166
Mashonaland Central	33 (8.2)	313 066
Mashonaland East	48 (12.0)	480 465
Mashonaland West	34 (8.5)	326 794
Matabeleland North	2 (0.5)	471 132
Matabeleland South	4 (1.0)	303 398
Total	401	3 785 036

[a]Provinces of origin not indicated for 4 patients

Table 2. Distribution of the clefts by gender[a]

Type of cleft	Gender, n (%)		
	Male	Female	Total
Cleft lip only	121 (60.8)	103 (51.2)	224 (56.0)
Cleft lip and palate	6 (3.5)	7 (3.0)	13 (3.3)
Cleft palate	71 (35.7)	92 (45.8)	163 (40.8)
Total	201 (49.8)	201 (50.3)	400

[a]Gender not indicaite for 5 patients

Table 3. Distribution of the patients in the provinces by gender and type of cleft

Province	n	Anomaly, n(%)		
		Cleft lip	Cleft Lip and Palate	Cleft Palate
Harare				
Male	64	42 (65.6)	1 (1.6)	21 (32.8)
Female	70	35 (50.0)	1 (1.4)	34 (48.6)
Bulawayo				
Male	11	0 (0.0)	0 (0.0)	11 (100)
Female	11	3 (27.3)	0 (0.0)	8 (72.7)
Manicaland				
Male	28	16 (57.3)	2 (7.1)	10 (35.7)
Female	19	10 (52.6)	0 (0.0)	9 (47.4)
Masvingo				
Male	26	13 (50.0)	3 (11.5)	10 (38.5)
Female	26	12 (46.2)	2 (7.7)	12 (46.2)
Midlands				
Male	13	12 (92.3)	0 (0.0)	1 (7.7)
Female	10	9 (90.0)	0 (0.0)	1 (10.0)
Mashonaland Central				
Male	14	12 (85.8)	1 (7.1)	1 (7.1)
Female	19	9 (47.4)	1 (5.3)	9 (47.4)
Mashonaland East				
Male	20	12 (60.0)	0 (0.0)	8 (40.0)
Female	28	15 (53.6)	1 (3.6)	12 (42.9)
Mashonaland West				
Male	16	12 (75.0)	0 (0.0)	4 (25.0)
Female	17	10 (58.8)	0 (0.0)	7 (41.2)
Matabeleland North				
Male	2	0 (0.0)	0 (0.0)	2 (100)
Female	0	0 (0.0)	0 (0.0)	0 (0.0)
Matabeleland South				
Male	3	2 (66.7)	0 (0.0)	1 (33.3)
Female	0	0 (0.0)	0 (0.0)	0 (0.0)
Total	397[a]	224	12	161

[a]Gender and province not indicated for 8 patients

Table 4. Distribution of patients by year of repair, gender and type of cleft

Year of repair	n (%)			n (%)			
	Male	Female	Total	Cleft lip	Cleft lip and palate	Cleft palate	Total
1981	1 (33.3)	2 (66.7)	3	1 (33.3)	0 (0.0)	1 (33.3)	1
1982	8 (38.1)	13 (61.9)	21	8 (61.5)	0 (0.0)	5 (38.6)	13
1983	4 (30.8)	9 (69.2)	13	8 (61.5)	0 (0.0)	5 (38.6)	13
1984	6 (37.5)	10 (62.5)	16	7 (43.8)	1 (6.3)	8 (50.0)	16
1985	16 (31.4)	35 (68.6)	51	28 (53.9)	2 (3.9)	22 (42.3)	52
1986	30 (48.4)	32 (51.6)	62	29 (46.8)	5 (8.1)	28 (45.2)	62
1987	30 (50.9)	29 (49.2)	59	36 (590)	1 (0.02)	25 (41.0)	61
1988	21 (43.9)	27 (56.3)	48	30 (60.0)	1 (2.0)	19 (38.0)	50
1989	34 (65.4)	18 (34.6)	52	1 (1.9)	1 (1.9)	52 (80.3	54
1990	40 (67.8)	19 (32.2)	59	37 (62.7)	3 (5.1))	19 (32.2)	59
1991	9 (46.2)	7 (32.2)	16 (78.4)	12 (75.0)	0 (0.0))	4 (25.0)	16
Total	199 (49.8)	201 (50.3)	400	225 (55.6)	13 (3.2))	167 (41.2)	405

Common postoperative complications in cleft surgery include partial wound dehiscence, vermilion notching, hypertrophic scarring, fistula, infection, abscess formation with a rate ranging from 3.8% to 15 %.[1],[2],[18]

This study was conducted to determine the prevalence, regional distribution in the country by province, gender distribution, age at time of repair, length of hospital stay and postoperative complications of patients who received surgery for non-syndromic CL, CLP and CP at two tertiary institutions in Zimbabwe during the period January 1981 to December 1991.

Methods

A retrospective review of theatre and surgical records of patients treated for CL, CLP and CP at Harare Central Hospital and Parirenyatwa Government Hospital, Harare, Zimbabwe, during the period January 1981 to December 1991,was carried out. The inclusion criteria for this study was all patients that had their names in the theatre records and whose surgical records/case files were also available. Exclusion criteria were patients who had their names in the theatre records, but surgical records/case notes were not available. Theatre records, surgical records/case files of all patients that fulfilled the inclusion criteria were retrieved. This search gave us a total of 405 patients.

The data was first entered into a structured record review form to capture information on gender, province of origin, type of cleft, numbers of patients per year per province, age at the time of repair, duration of stay in hospital and complications. Included in the final data analysis were cases in which complete data were available while cases with incomplete information were only included in the aspects were data was available.

The number of births registered during this period were obtained from the Registrar of birth and deaths. The data from the record review form was entered into an Excel spreadsheet and imported into Stata Version 8.4 (Stata Corp., USA) for descriptive analysis. Descriptive data was analysed to create summary data: means and median age of the patients at the time of surgery of each of the anomalies, frequencies, percentages, and creation of one way and two way tables, and graphs. The information generated was then compared to findings of other studies in the literature.

Parirenyatwa Government Hospital and Harare Central Hospital are the only two centres in the country offering surgery for CL, CLP and CP.. The patient sample could be regarded as fairly representative of the country.

Results

Table 1 shows the distribution of the patients by province and registered births per province with Bulawayo included in the Matabeleland province, 4 patients' province of origin was not indicated. A total of 405 patients with non-syndromic CL, CLP and CP were treated during this 11-year period. Harare province, the capital city, had the highest number of patients, 33.7 % (n= 135). The lowest number of patients came from the two Matabeleland provinces South and North, 1% (n= 4) and 0.5% (n= 1) respectively.

Table 2 shows the distribution of the clefts by gender(5 patients gender not indicated) :49.8% (n=199) were males and 50.3% (n=201) were females ; male to female ratio of 1:1; CL (56%) with male predominance (60.8 %) was most common; CLP (3.3%) was least common.

Table 3 shows the distribution of patients in the provinces by gender and type of cleft: CL is most common in all provinces with male preponderance (except in Mashonal-

Table 5. Median age in months at repair in children (under 17 years) and adults (over 17 years)

Type of cleft	Median age at repair (interquartile range), months	
	Children (under 17 years old)	Adults (over 17 years old)
Cleft lip	9 (6-18)	252 (216-276)
Cleft lip and palate	12 (12-30)	396 (324-468)
Cleft palate	24 (18-36)	288 (204-324)

and East with female preponderance, 53.6% (n=15); CL was highest in Harare, 65.6% (n=42) in Harare).

Table 4 shows the distribution of the patients by year of repair, gender and type of cleft. There was a steady increase in the number of patients treated over the years.

Table 5 shows the median age, by cleft, at time of repair in children (under 17 years) and adults (over 17 years). The median age in months at the time of repair was 9 months for CL, 12 months for CLP and 24 months for CP. The respective interquartile ranges are shown in Table 5.

Table 6 compares the occurrence of CL, CLP and CP in this study with other studies in the literature. During the period under study 3 785 036 births were registered for the whole country (Table 1). Three hundred fifty-eight (358) of the patients treated were born during this period. This gives a prevalence rate of 0.1 per 1000 registered births. This is much lower than that quoted from other studies.

Figure 1 shows the trend of repair of clefts by gender. There is an increase in the numbers seeking surgery over the years. There is a sharp increase between 1985 and 1988 with a sharp drop in 1991.More females than males were attending for surgery.

Figure 2 shows the trend of clefts repair over the period under study. Cleft lip remains the most treated cleft raising throughout the period with the highest being recorded in 1987 and 1990.

The average hospital stay was 7.5 days for CL, 9 days for CLP and 8 days for CP.

Recorded complications were infection in 10 patients (2.54%) and palatal wound dehiscence in 16 patients (4%).

Discussion

The present study showed a wide variation in the prevalence of CL, CLP and CP in the provinces as indicated by the number of patients coming for surgical treatment from the provinces. The majority of patients were from the Harare province despite the low number of registered births in this province. This figure could be distorted by the fact that the surgical treatment centres are all situated in Harare city and hence patients tend to give addresses of convenience. A similar study in Zimbabwe indicated clustering of patients in the cities of Harare and Bulawayo.[32] Accurate data is difficult to obtain in retrospective studies. This could also explain the low figures for the Matabeleland provinces as they are all referred through Bulawayo city and hence tend to use convenient Bulawayo city addresses. Masvingo province has the second largest number of patients closely followed by Manicaland and Mashonaland provinces. Treatment seeking behaviour could be linked to the vast distances patients have to travel to the only centres were such services are available. Travel and hospital admission costs could also limit the number of patients attending for surgery as well knowledge of what can be offered and where one can access them.

In the present study there was an equal number of males and females presenting with CL, CLP or CP. This is in agreement with other studies which show equal male and female distribution.[12],[34]

There were gender differences with regards to the affliction by the different clefts. CL was the most common anomaly with male predominance (similar to other African studies) followed by isolated CP with CLP the least common. The male dominance is in agreement with other African and European studies.[13],[14],[25]

The dominance of CL is at variance with some Asian and Caucasian studies which report CP as the most common

Table 6. Comparison of occurrence of cleft lip and cleft palate in previous and the present study[3]

Author	Population	Duration of study, years	N	Proportion/1000
Owens et al.[16]	British	13	325 727	1.4
Fathallah[24]	Iraqis	3	229 992	0.8
Agbemoku[23]	Ghanaians	4	4000	6.3
Omo-Aghoja et al.[26]	Nigerians	1	5037	1.35
Msamati et al.[18]	Malawians	1	25 562	0.67
Dreise et al.[25]	Ugandans	1	26 286	0.73
Kesande et al.[3]	Ugandans	6	25 985	0.77
Present Study	Zimbabweans	11	3 785 036	0.09

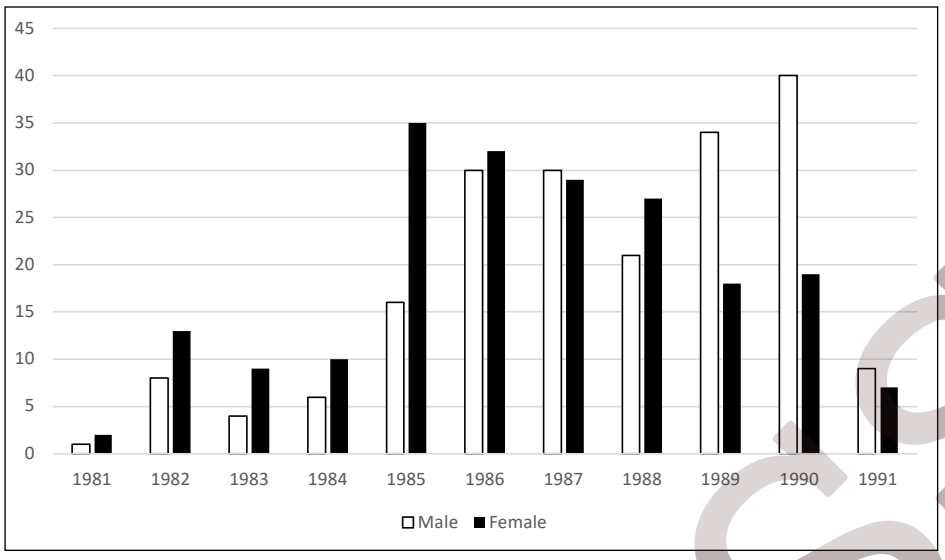

Figure 1. Trend of cleft repairs by gender over the period of study

anomaly.[4],[7],[15],[16] Our high Cl prevalence is in agreement with other African studies: Zambia[11] The preponderance of CL in this study is also confirmed by a recent study in Zimbabwe which showed that CL was most common with CP the least.[32] World-wide literature also indicate that CL is the most common anomaly.[27] Some of the variation could be attributed to differences in study design, small samples, retrospective or hospital –based studies in low and middle income countries in Africa although biological variations may not be discounted.[19] The distribution of cleft types may also be racially or ethnically determined.[19],[25] The low prevalence of isolated cleft palate in this study as in other African studies could be linked to high mortality rate in this group associated with functional difficulties during feeding in young infants.[19],[26] The male preponderance noted in this study is also noted in some African studies.[19] Some European studies show that cleft palate is most common in males with CL most common in females and that CP is the most common cleft in these populations.[7],[15],[33]

The median age for repair is at variance to that reported in the literature. This may be due to the limited availability of cleft surgery. Adult patients attended for surgery as well. This could be due to ignorance of services that could be rendered to patients with clefts.

Data collected from birth defect monitoring programmes is likely to give more representative information .However, some reports have indicated that neonatal reporting in maternity wards do not contain complete records of neonates with clefts missing cases by between 2- 8.9%.[17] Lethal outcome shortly after birth (up to 6 months) has been recorded to be up to 6.6%.[17] The present data may thus represent characteristics of only those patients who accessed reconstructive surgery and does not include those who died in the neonatal period or later on or failed to access surgery for various reasons. Accurate information on orofacial clefts may be obtained from centres dedicated to the management of orofacial clefts with standardised recording and classification systems.

In the present study it is difficult to calculate the prevalence rate due to the difficulties in accessing accurate birth records. The very low prevalence rate of 0.1 per 1000 is similar to the S. African prevalence of 0.1-0.4 per 1000 live births[13],[14] and differs from other African studies: 0.7 in Malawi,[22] 0.9 in Sudan,[32] and 1 in Nigeria.[3] These are much lower than that of Asian and Caucasian countries which range between 1.3 to 1.9 per 1000 births.[7],[17],[20] The prevalence was calculated based on registered births and yet some births may not have been registered. The creation orofacial deformities birth registry at hospitals and clinic where babies are delivered would produce accurate data. However, this still leaves out home deliveries.

There was an increase in the number of patients seeking treatment over the years. This could be related to the increase in penetration of health service delivery countrywide from 1981 onwards and thus more patients are referred for reconstructive surgery. This study is limited to the period 1981-1991 which period there were no visiting cleft surgery teams. Lately there has been an influx of surgical teams from abroad that offer "free" cleft surgical services. This certainly increases access to cleft surgery. The teams started coming to Zimbabwe around 2005.This has opened surgical services to a large catchment area.[33]

Some of the epidemiologic data they collected is in agreement with the findings of this study 29, 33.

There was no information on the classification method used for recording the clefts before surgery. No information was available on cleft alveolus possibly being regarded as either part of CL, CLP or CP. There was also no information on laterality of the clefts.

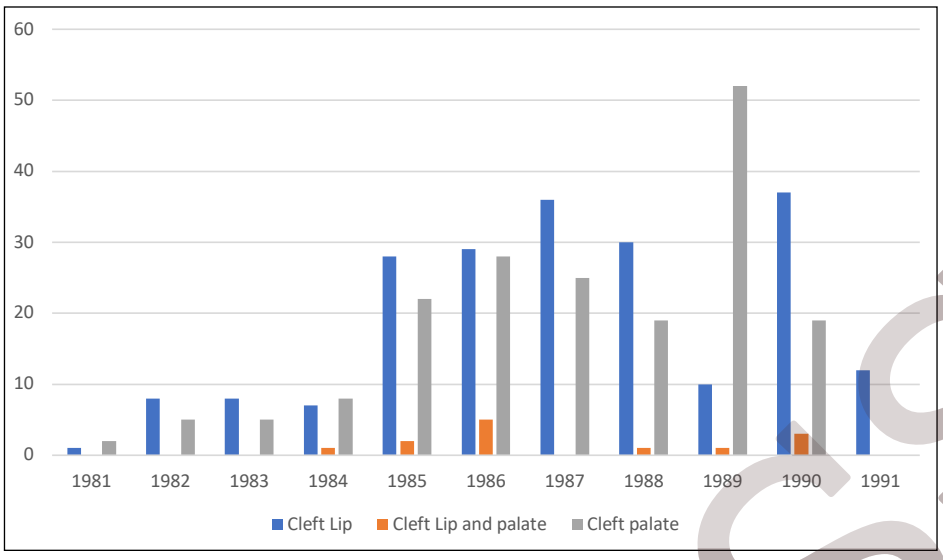

Figure 2. Trend of cleft repairs over the period of study by type of cleft

The CL was the most common cleft with male predominance. This is in agreement with other studies that show that CL is the most common cleft with male predominance. [5],[17],[19],[33] This could be due to the fact that parents are more prone to bring in their child due to its prominent disfiguring appearance.

Isolated CP was the second most common cleft as similarly reported in other studies Similar to other studies it had a female predominance. The figure is much higher than in most African studies but similar to some European studies. [7],[17]

In our study CLP was the least common cleft unlike in other studies that have shown it to be the most common cleft.[4],[13],[14] This difference could be due to racial or geographic factors or data collection methods.

In children the median age at the time of repair of CL was 9 months, 12 months for CLP and 24 months for CP with much higher figures in the adult population. This is at variance with other studies which recommend repair at varying periods such as from the time of birth to 13 months. [6],[13],[14],[23] The difference could be attributed to limited surgical services along with difficult access to these services. In our institutions we have adults seeking cleft surgery which had been neglected in childhood. The shift is now towards early repair of the lip. This may not be possible in our environment due to limited access to the services. Hospital stay was much longer than in other studies. This is linked to attempts to cut down on the costs related to the long distances some patients had to travel for further review.

The only complications recorded were infection 2.5% and wound dehiscence 4.0%. This is within the normal range of postoperative infection following cleft surgery.[1],[31]

This study shows that the prevalence of CL, CLP and CP is comparable to other studies with the exception of the rather high CL. There is wide regional distribution of the clefts in the country. There is need for standardised recording and classification of orofacial clefts in Zimbabwe along with accurate recording of live births be they home or hospital deliveries.

Limitations

This is a retrospective study based on a review of hospital records and as such subject to limitations of retrospective studies. The hospital records may have incorrectly recorded age, gender, province of origin based on the given patient's address and under-reporting. The records may suffer from multiple sources of ascertainment biases. Some cases may not have been entered in the theatre records. Due to different recording systems by the surgeons some of the clefts may not have been accurately recorded or missed out completely.

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