Birth prevalence of cleft lip and palate based on hospital records in Dar es Salaam, Tanzania

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Abstract
Aim: The aim of the study was to determine the prevalence of cleft lip, cleft palate and cleft lip and palate in hospital live births in Dar es salaam, Tanzania. Study design: this was a retrospective study using hospital data. **Materials and methods:** The records of 75336 live births delivered at three public hospitals in Dar es Salaam were examined. **Results:** Thirteen cases of cleft lip and cleft palate were recorded giving a prevalence of 17 per 100,000. Boys were more affected than girls with a male to female ratio of 2.25:1. However, 6 (46.2%) out of all the cases had both cleft lip and palate, 4 (30.8%) had cleft lip only and 3 (23.0%) had cleft palate alone. **Conclusions:** In this study the birth prevalence of cleft lip, cleft palate and cleft lip and palate in Dar es Salaam, was low (17 per 100,000 births). There were more boys than girls who were recorded to be born either with a cleft lip, cleft palate and cleft lip and palate.

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Introduction

Congenital anomalies of the orofacial region are a diverse group of complex defects affecting orofacial structures. These are caused by abnormal development of the facial processes during gestation. Collectively these anomalies are classified by WHO under craniofacial anomalies and they affect a significant proportion of population worldwide (1). These defects commonly involve the upper lip, the hard and soft palate (2). They frequently occur as isolated deformities but can be associated with other systemic conditions particularly congenital heart diseases and a variety of syndromes (3). In a study done by Autoscewki and Kruk (4) it was documented that cleft lip (CL) with or without cleft palate was the commonest anomaly and most frequently affected native Americans followed by Japanese, Caucasians and African Americans. Isolated cleft palate (CP) was found to be the next common congenital anomaly in the same study.

These anomalies can affect the way the child's face looks and compromise the esthetics. They can also lead to problems with eating, talking, and ear infection. The impact of these defects on morbidity, health care costs, emotional and social disturbances can be high**.** Risk factors for these defects have been suggested and include genetic factors as well as environmental factors such as certain types of viral followed by CL and CP. Another study in Malawi (7) reported a prevalence of 0.7 per 1000; a prevalence which was described as the lowest incidence of cleft lip and palate ever reported among black people. Some of the highest prevalence of CL is 2.28 per infections, and the use of teratogenic substances during pregnancy have been suggested to play important roles as risk factors (2)**.** Heredity tendency as evidenced by affliction of a number of members within families has been found in 25% to 30% of reported cases worldwide (5)**.** However, there is no data indicating a direct correlation between any specific drug and exposure to chemicals, and orofacial anomalies.

Cleft lip commonly affects the upper lip resulting into a bifid lip due to failure of fusion between the embryonic processes of the upper lip. The degree of cleft lip vary greatly from mild where there is only notching of the lip to severe which presents with a large gap from the lip tip through the nose.

Studies on the prevalence of these anomalies have shown great variation from report to report (2)**.** It was once indicated that clefts of the lip and palate occur in about 1 in every 1200, however recent reports show that these types of anomalies occur in 1 in every 500-550 births, with a male to female ratio of 3: 1 (2). In Sudan, a study by Suleiman (6) demonstrated a prevalence of 0.9 per 1000 in which there were more girls than boys affected with a male to female ratio of 3:10. Similarly the study showed that cleft lip and palate (CLP) was the most frequently encountered

10000, which was reported in Bolivia (1, 8). Zhang (9) has reported a similar high prevalence in Mongolian population. The highest reported prevalence of CP was 10 to 14 per 10000 in Finland (8) where prevalence of CP was higher than what has

been reported in Northern Europe, followed by Scotland with a prevalence of 8 in 10000 (1). It has also been shown that CL is much more frequent on the left side and is noted that incidence in Negroes is much lower than in Caucasian (10).

In a study done by Jensen in Denmark (11) it was found that the distribution of clefts was CL 33.5%, CLP 39.1%, and CP 7.4%. Tolarová (6) indicated that sex ratio of patients with clefts varied among whites, with CL and CLP occurring significantly more often in males than in females, while CP occuring more significantly in females. A previous study by Tolarová (12) on a sample of 8,952 on orofacial clefts in whites, the male to female ratios were 1.50-1.59:1 for CL, 1.98-2.07:1 for CLP and 0.72-0.74:1 for CP. In a textbook by Kruger, the prevalence of clefts in different racial groups was shown to be considerably variable, and the lowest prevalence was found in blacks (5). In the same report by Kruger (5) the highest prevalence of CLP was shown to be in North American Indians followed by Japanese populations. However no remarkable variation among races was found in isolated CP (4). In particular its prevalence did not vary significantly between black and white infants or between infants of Japanese and European origin in Hawaii (1). In the study done by Tolavorá and Cervenka (2) it was shown that the birth prevalence among mixed races in California, non Hispanic whites had the greatest prevalence of isolated clefts, followed by Asian with slightly lower prevalence, and the blacks had the lowest prevalence. In analysis of the prevalence of CL and CP in Lodz (Poland) during the period between 1981and1995 revealed that CP occurred most frequently, where as CLP, and isolated CL was less frequent. CLP were frequently seen in boys where as isolated CL was observed equally in girls and in boys (11). The same study showed that unilateral cleft lip (UCL) or unilateral cleft palate (UCP) occurred at a significantly higher rate than bilateral ones, with boys being more affected than girls.

There is no documentation of CL, CP, CLP, and other orofacial anomalies in Tanzania. The aim of this study was therefore to document the prevalence of different types of cleft lip and palate in live births in Dar es Salaam, using hospital data.

Materials and methods

This was a retrospective study using hospital-based information. The study was done in Dar es Salaam region, Tanzania. The study was conducted in three of the four public hospitals; Muhimbili national hospital which is also a referral hospital and two of the municipal hospitals. Records of 75,336 live births with complete demographic information and the health state of the baby at birth, in the three hospitals from the year 1999 to 2004, were retrieved. Presence of CL, CLP, and CP was recorded in a special form. Other congenital anomalies associated with cleft lip and cleft palate were also recorded. Other information including birth weight, age at delivery in weeks and type of management provided were also recorded.

Table 1: Proportion of deformities per one hundred thousand live births

Hospital	Total live births recorded	Babies born with clefts	Prevalence /100,000
Mwananyamala	30220	7	23
Muhimbili	32235	4	12
Temeke	12881	2	16
Total	75336	13	17

The study involved examination of medical records as such it involved private information of human subjects. A letter of introduction was therefore requested from the school of dentistry explaining the aim of the study to authorities in the respective hospitals. Data collection did not involve personal records such as names of the babies. This protected babies whose data were collected. Ethical clearance was obtained from the ethics committee of Muhimbili University college of Health Sciences and permission to conduct the study was obtained from the respective hospital administration.

Results

Thirteen cases of CL, CP or CLP were recorded out of 75336 live births. Seven cases were recorded at Mwananyamala, 4 cases at Muhimbili, and 2 cases at Temeke with an overall prevalence of 17 per 100,000 (Table 1). There were 4 out of the 13 cases (30.8%) of CL, 6 cases (46.2%) of CLP and 3 cases (23.8%) of CP. A total of 9 boys out of the 13 cases making up 69.2%, and 4 girls making up 30.8% were found with CL, CP or CLP (Table 2). The birth weight recorded ranged from 2000gms-3500gms and out of the 13 babies found with clefts, most of them (84.6%) were below 3000gms, while a small proportion (15.4%) was found in the birth weight group of 3000gms or more.

Table 2: Distribution of the deformities by type and sex

Sex	Type of Deformity			
	Cleft Lip n (%)	Cleft Lip and Palate n (%)	Cleft Palate n (%)	Total n (%)
Boys	3 (75%)	4 (66.7%)	2 (66.7%)	9 (69.2%)
Girls	1 (25%)	2 (33.3%)	1 (33.3%)	4 (30.8%)
Total	4 (100%)	6 (100%)	3 (100%)	13 (100%)

Table 3. Distribution of the deformities by birth weight

Birth weight (in gm)	Type of Deformity			
	Cleft Lip (n)	Cleft Lip and Palate (n)	Cleft Palate (n)	Total n (%)
2000-2499	0	0	3	3 (23.1%)
2500-2999	4	4	0	8 (61.5%)
≥3000	0	2	0	2 (15.4%)
Total	4	6	3	13 (100%)

Discussion

In the present study, there were 13 cases of CL, CLP, and CP out of 75,336 live births, which were documented. This gives a prevalence of 17 per 100,000 that seems to be the lowest prevalence compared with other studies (1, 3, 6, 11). The prevalence of 70 per 100,000 reported in Malawi (6) was once considered the lowest among African population.

Among the 13 cases recorded in this study 4 (30.8%) had isolated CL, 6 (46.2%) had CLP and 3 (23.8%) had isolated CP. This study shows that the proportion of cases with CLP is higher followed by CL and finally CP. This agrees with the prevalence reported by Jensen (12) in Denmark who reported highest prevalence of CLP followed by CL and CP. However, the prevalence found in our study is much lower than that in Denmark. The prevalence in this study agrees with what was reported in Sudan (6), which showed a highest prevalence of CLP followed, by CL and CP. The findings that CP accounted for 23.8% of all anomalies agree with what was reported by Autoscewki and Bruk (4), who reported CP to be the least frequent.

In this study boys were more affected than girls giving a male to female ratio of 2.25:1. This differs from previous reports from other parts of Africa including Sudan and Malawi (6, 7) which showed that females were more affected than males with a male to female ratio of 1:3.3. The sex differences in this study are similar to that reported among whites where the prevalence of CL and CLP was higher among boys compared to girls (9). However this differs from what was reported by Tolarova (12) whereby prevalence of CL was observed equally among boys and girls. In the same study the prevalence of CLP was reported to be higher in boys than in girls. On the other hand, the higher prevalence of CP in boys than in girls in our present study, differs from reports among whites whereby girls are more affected than boys (12). The reason for these differences was not established in the current study.

With regard to birth weight, most babies recorded to have been born with clefts had birth weight of less than 3000gms, while a small proportion was recorded in the birth weight of 3500gm or more. However during our literature search, there was no previous study reporting a relationship between birth weight and clefts.

Conclusions

The prevalence of cleft lip and cleft palate among hospital live births in Dar es Salaam was lower than previous reported data elsewhere, and there was a higher proportion of boys than girls affected. Most of the clefts were found in the lower birth weight groups indicating a possible relationship between birth weight and clefts. More studies are recommended to determine the etiological factors.

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