Community Dental Health (2010) **27,** 118–121
Received 11 December 2007; Accepted 30 November 2008

doi:10.1922/CDH_2404-Yassaei04

Prevalence of cleft lip and palate in births from 2003 – 2006 in Iran.

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Objective: To determine the prevalence of cleft lip and palate in births taking place in hospitals in the Yazd province, Iran. **Method:** The records of 65,236 live births delivered at 12 hospitals in Yazd province, including Yazd city and four cities of the states, over a four year period from 2003 to 2006 were examined. **Results:** Fifty six cases of cleft lip and palate were found, a prevalence of 0.86 per 1,000. Among the fifty six cases, there were seventeen cases (30.4%) of isolated cleft palate; thirteen cases (23.2%) of cleft lip and twenty six cases (46.4%) of cleft lip and palate. No statistically significant difference in the occurrence of cleft lip and palate were observed by the season of the birth, gender of newborn or maternal age. In regard to type of cleft, the prevalence of isolated cleft palate was higher in females than in males (p=0.04). The prevalence of cleft lip was higher in summer than other seasons (p=0.01). **Conclusion:** The prevalence of cleft lip and palate among live births in Yazd is 0.86 per 1,000 births, that is 1 per 1,163 births.

Key words: *Cleft lip, cleft lip and palate, isolated cleft palate, prevalence.*

Introduction:

The prevalence of cleft lip and palate is reportedly different in different races. In U.S.A, the prevalence is 1.3/1000 births (Tolarova *et al*. 1998). In black people, the prevalence is lower at 0.7/1000 births (Msamati, 2000). Suleiman *et al*. (2005) in their study at three hospitals in Sudan between 1997 and 2000 reported 13 cases of cleft lip and palate in 15,890 births (0.8/1000) and the prevalence in females was higher than males (10: 3).

Al Omari and Al Omari (2004) studied the prevalence of cleft lip and palate in Jordan between 1991 and 2001 and reported an incidence of 1.39/1000 births. Of the total, 30% had cleft lip, 22% isolated cleft palate and 48% had both cleft lip and palate. The prevalence of cleft lip and palate was higher in males than in females and its prevalence in combination with Syndromes, for example Pierre Robin syndrome, and/or other defects, for example cardiovascular disorder, was 18%.

Kim *et al*. studied the prevalence of cleft lip and palate between 1993 and 1995 in Korea and of the 715,817 births, 1,293 had cleft lip and palate (1.81/1000 births or 1 in 554 births). Of the total, 34.1% had cleft lip, 35.8% had isolated cleft palate and 30.1% had both cleft lip and palate. The prevalence of cleft lip and palate in males was twice that in females.

Natsume *et al*. (1987) studied the prevalence of cleft lip and palate in 1982 in Japan and of the 40,304 births, 83 had cleft lip and palate (2.06/1000 births). Of the total, 32.7% had cleft lip, 21.2% had isolated cleft palate and 46.1% had both cleft lip and palate.

Amidei *et al*. (1994) studied the prevalence of cleft lip and palate in Colorado from 1982 to 1988 and of 381,175 births, 307 had cleft lip and palate (0.81/1000 births).
Considering the fact that the prevalence of cleft lip and palate varies in different races (Vanderas, 1987), the authors decided to study the rate of incidence of cleft lip and palate in Iran.

Materials and Methods:

In this descriptive cross sectional study, the files of the live births in the Yazd province , which is the central province of Iran, were studied. Yazd city is the capital of Yazd province. The population of Yazd in 2006 was estimated to be 990,818 (Akbarian Bafghi, 2008).
The study included all files of live births from both government and private hospitals in the city of Yazd and its four cities over a four year period between 2003 and 2006. The number of studied files from each hospital is shown in Table 1.

The gathered data was analyzed using the SPSS 13 software and chi square test used to assess statistical significance ($p<0.05$).

Results:

The prevalence of cleft lip and palate was 0.086 percent (Table 2). In other words, of every 1,165 births, one child had the defect. In the study, 56 cases of cleft lip and palate were observed of which 30.4% had isolated cleft palate, 23.2% cleft lip and 46.4% had both cleft lip and palate.

Of the 65,236 births, 33,593 were male and 31,643 were female (Table 3). Of the 33,593 males, 30 cases (0.089%) had the defect, while of the 31,643 females, 26 (0.082%) had the defect (p=0.75). On considering the defects individually, the prevalence of isolated cleft palate was significantly higher in females (p value = 0.04). There was no significant difference between the incidence of cleft lip and palate in different seasons (p=0.81) (Table 4), but on considering the defects individually, the prevalence of ceft lip was significantly higher in summer (p= 0.01).

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Table 1. Name of hospital and number of newborns studied in each hospital

Name of hospital	*Location*	*Type of hospital*	*No. of live births*
Afshar	Yazd	Public	1776
S.Shohada	Yazd	Private	5397
Social Security	Yazd	Public	14457
Mother	Yazd	Private	6563
Mojibian	Yazd	Private	14977
Gudarz	Yazd	Private	1772
Sh. Sadoughi	Yazd	Public	6171
Mortaz	Yazd	Private	2876
Imam Jafar Sadegh	Maibod	Public	3899
Ghaem	Ardakan	Public	4376
Fatemah al Zahra	Mehriz	Public	1231
Vali Asr	Bafgh	Public	1743
		Total	65,238

Table 2. Distribution of various types of cleft lip and palate in the population under study

Type of Defect	*Number*	*Percentage*
Any defect	56	0.028
Isolated cleft palate	17	0.026
Cleft Lip	13	0.020
Unilateral cleft lip and palate	19	0.029
Bilateral Cleft Lip and Palate	7	0.011
No Defect	65180	99.91
Total	65236	100

Table 3: Distribution of various types of cleft lip and palate on basis of gender

Gender / *Type of Defect*	*Male*		*Female*		*Total*		*p value*
	No	*%*	*No*	*%*	*No*	*%*	
Isolated cleft palate	5	0.015	12	0.038	17	0.026	0.04
Cleft lip	8	0.024	5	0.016	13	0.020	NS
Cleft lip and palate	17	0.051	9	0.028	26	0.040	NS
Cases with cleft defects	30	0.089	26	0.082	56	0.086	NS
Cases without cleft defects	33563	99.91	31617	99.90	65180	99.91	
Total	33593	100	31643	100	65236	100	

Table 4. Distribution of various types of cleft lip and palate on basis of season of birth

Season / *Type of Defect*	*Spring*		*Summer*		*Autumn*		*Winter*		*p value*
	No	*%*	*No*	*%*	*No*	*%*	*No*	*%*	
Isolated cleft palate	3	0.019	4	0.023	5	0.032	5	0.030	NS
Cleft lip	1	0.006	6	0.035	3	0.019	3	0.018	0.001
Cleft lip and palate	8	0.051	8	0.046	5	0.032	5	0.030	NS
Cases with cleft defects	12	0.076	18	0.1	13	0.083	13	0.078	NS
Cases without cleft defects	15589	99.92	17292	99.90	15492	99.84	16807	99.92	
Total	15601	100	17310	100	15505	100	16820	100	

Table 5. Distribution of various types of cleft lip and palate on basis of mothers' age

Mothers' Age / Type of Defect	< 20 yrs*		20-30 yrs		> 30 yrs		p value
	No	%	No	%	No	%	
Isolated cleft palate	2	0.029	11	0.022	4	0.046	NS
Cleft lip	1	0.015	12	0.024	0	0.0	NS
Cleft lip and palate	2	0.029	23	0.046	1	0.012	NS
Cases with cleft defects	5	0.073	46	0.092	5	0.058	NS
Cases without cleft defects	6872	99.93	49628	99.91	8680	99.94	
Total	6877	100	49674	100	8685	100	

*yrs: years

There was no significant difference in the prevalence of cleft lip and palate according to the mothers' age (Table 5).

In addition to the above results, of the 56 cases with cleft lip and palate, one case was microcephalic, two had Downs' syndrome and one case had multiple anomalies that died several hours after birth. Two cases had anomalies of the upper and lower limbs and one of them died after birth. One newborn had concurrent renal abnormalities. Thus, overall, seven cases had cleft lip and palate along with syndromes, an incidence rate of one in 9,319 births. Of the 56 cases with defects, one of them was a heterozygote twin with the defect.

Discussion:

Evaluation of 65,236 files of newborns in 12 hospitals of Yazd province over a four year period between 2003 and 2006 revealed cleft defects in 56 newborns. The present study showed that cleft lip and palate was seen in 0.86/1000 births or in other words, 1 /1165 births. In populations of Poland (Antoszewski *et al*. 1997), Germany (Hruskova *et al*. 1998), U.S.A (Tolarova *et al*. 1998) and Korea (Kim *et al*. 2002), the prevalence of cleft lip and palate was 1.85, 2, 1.3 and 1.81 per 1,000, respectively. This difference in the prevalence rates in Iran and the above-mentioned countries could be attributable to difference in race. In addition, the effect of environmental factors, especially alcohol consumption during pregnancy (Lorente *et al*. 2000, Edwards *et al*. 2003) can have an effect on the incidence of cleft lip and palate. The low prevalence of this defect in Iran could be due to the religious beliefs and near-zero consumption of alcohol by pregnant women in the country. This becomes more evident when it is seen that the prevalence of cleft lip and palate in Sudan, also is 0.9/1000 births (Suleiman *et al*. 2005). In the study by Ghassempour *et al*. on records of 14,036 live births between 1995 and 1999 in Babol city in the north of Iran, the prevalence of cleft lip and palate was 0.78/1000 births. The difference between the results of the present study and the Ghassempour study indicate that perhaps the prevalence of cleft lip and palate is on the rise in Iran; both studies used the same method..

Fogh-Anderson reported a rise in the prevalence of cleft lip and palate in Denmark (1967) such that the prevalence of cleft disorders has risen from 1.5/1000 births to 2/1000 births in the last 50 years and the results of the present study are in line with the Fogh-Anderdson study, though not of the same magnitude.

Taher studied records of 21,137 live births a Tehran hospital between 1983 and 1988 and reported the prevalence of cleft lip and palate to be 3.7/1000 births. On comparing the results of the Taher study with the present study, we can conclude that the prevalence of cleft lip and palate has fallen significantly in recent years. This could show the role of stress in the incidence of cleft lip and palate (Saxén 1974, Rosenzweig 1966) given that the study of Taher was conducted at the time of the Iran–Iraq war.

The separate studies by Taher (1992) and Ghassempour *et al*.(2002), Suleiman *et al*.(2005), Talarova *et al*.(1998) and Al Omari *et al*. (2004) reported that the highest frequency was that of cleft lip and palate together that is similar to the present study. Suleiman *et al*. (2005), and Talarova *et al*. (1998) reported that cleft lip had the lowest frequency, but Taher (1992), Ghassempour *et al*.(2002), Kim *et al*. (2002) and Al Omari *et al*. (2004) reported otherwise.

The results of the present study suggest that the prevalence of cleft lip and palate is more common in males than females, the difference however was not statically significant ($p = 0.75$). The study by Al Omari *et al*.. (2004) in Jordan similarly identified higher incidence of cleft lip and palate in males. When assessing the defects individually, the present study showed the prevalence of isolated cleft palate was significantly higher in females ($p = 0.04$), but the prevalence of cleft lip and palate was higher in males than females (Table 3).

On evaluating the distribution of cleft lip and palate according to the age of the mothers, the highest prevalence was in mothers aged between 20 and 30 years. This high prevalence in this age group cannot be attributed to age alone as the frequency of pregnancies is also higher in this group. However, certain studies have reported differently. In the study by Soo-Hoong Hu *et al*. (2005), the prevalence of these defects was higher in mothers' younger than 20 years old as compared to mothers older than 20 years old and age below 20 years was considered as a risk factor for development of cleft lip and palate. Bille *et al*..(2005) reported that older age of both mother and father are risk factors for the development of cleft lip and palate in newborns.

On evaluating the different types of cleft defects individually, the incidence of cleft lip in summer was significantly higher than other seasons. The study by Korst B *et al*. (2006) showed that the incidence of cleft lip and palate was significantly lower in winter as compared to the other seasons. But the study by Amidei *et al*. (1994) showed that there is no significant relationship between the season of birth and cleft lip and palate, which is in line with the present study.

Overall, seven cases had cleft lip and palate along with syndromes or other defects and the prevalence was 12.5%, while this prevalence in the study by Al Omari *et al*. (2004) was 18%.

Summary

In summary this study reviewed all births in the Yazd province in Iran over a four year period and found an incidence of cleft lip and palate to be approximately 0.86 per 1,000 births. The individual distributions of cleft defects were as follows: isolated cleft palate 17 / 65,236, isolated cleft lip 13 / 65,236, unilateral cleft lip and palate19 / 65,236, bilateral cleft lip and palate 7 / 65,236 (Table 2).

References:

Akbarian Bafghi MJ. (2008): *Comprehensive book on general information of Yazd*. First edition; New Science Publications; P18. Yazd.

Al Omari F, Al-Omari IK.(2004): cleft lip and palatein Jordan: birth prevalence rate. *Cleft Palate- Craniofacial Journal* **41**,609-612.

Amidei RL, Hamman RF, Kassebaum DK, Marshall JA.(1994): Birth prevalence of cleft lip and palatein Colorado by sex distribution, seasonality, race/ethnicity, and geographic variation. *Special Care in Dentistry* **14**,233-240.

Antoszewski B, Kruk-Jeromin J.(1997): Epidemiology of cleft lip and palatein Lodz, Poland, in the years 1981-1995. *Acta Chirurgiae Plasticae* **39**,109-112.

Bille C, Skytthe A, Vach W, Knudsen LB, Andersen AM, Murray JC, Christensen K. (2005): Parent's age and the risk of oral clefts. *Epidemiology* **16,**311-316.

Edwards MJ, Agho K, Attia J, Diaz P, Hayes T, Illingworth A, Roddick LG.(2003): Case-control study of Cleft Lip or palate after maternal use of topical corticosteroids during pregnancy. *American Journal of Medical Genetics***120A**,459-463.

Fogh – Anderson P. .(1967):Genetic and non – genetic factors in the etiology of facial clefts, *Scandinavian Journal of Plastic and Reconstructive Surgery and Hand Surgery* **1**,22 – 29.

Ghassempour M, Keshwari K.(2002): Prevalence of cleft lip and palatein newborns at Yahyanejhad hospital, Babol between 1995 and 1999. *Seasonal Journal of the Research Health Center of Jahad University* **3**, 175-181.

Hruskova H, Calda P, Zizka Z, Krofta L, Baxova A, Zidovska J, Kapras J, Zivny J. (1998):Cleft Lip and Palate--prenatal diagnosis and counseling. *Ceska Gynekol.ogie* **63**, 382-387.

Kim S, Kim WJ, Oh C, Kim JC. (2002): cleft lip and palateincidence among the live births in the Republic of Korea. *Journal of Korean Medical Science* **17**,49-52.

Krost B, Schubert J. (2006):Influence of season on prevalence of Cleft Lip and Palate. *International Journal of Oral and Maxillofacial Surgery***35,**215-218.

Lorente C, Cordier S, Goujard J, Aymé S, Bianchi F, Calzolari E, De Walle HE. 2000:Tobacco and alcohol use during pregnancy and risk of oral clefts. Occupational Exposure and Congenital Malformation Working Group. *American Journal of Public Health*.**90,**415-419.

Msamati BC, Igbigbi PS, Chisi JE.(2000): The incidence of cleft lip, cleft palate, hydrocephalus and spina bifida at Queen Elizabeth Central Hospital, Blantyre, Malawi. *Central African Journal of Medicine* **46**,292-296.

Natsume N, Suzuki T, Kawai T. (1987): The prevalence of cleft lip and palatein the Japanese: their birth prevalence in 40,304 infants born during 1982. *Oral Surgery Oral Medicine Oral Pathology* **63,**421-423.

Rosenzweig S. (1966): Psychological stress in cleft palate etiology. *Journal of Dental Research* **45**,1585-1593.

Saxén I. (1974): cleft lip and palatein Finland: parental histories, course of pregnancy and selected environmental factors. *International Journal of Epidemiology* **3**,263-270.

Suleiman AM, Hamzah ST, Abusalab MA, Samaan KT. 2005: Prevalence of cleft lip and palatein a hospital-based population in the Sudan. *International Journal of Pediatric Dentistry* **15**,185-189.

Taher AA. (1992): cleft lip and palatein Tehran.*The Cleft Palate-Craniofacial Journal* **29,**15-16.

Tolarova MM, Cervenka J. (1998): Classification and birth prevalence of orofacial clefts. *American Journal of Medical Genetics***75,**126-137.