

# The incidence of cleft lip and palate in a Kurd population: a prospective study

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**Aim:** To assess the incidence of cleft lip and palate and factors associated with them in the hospital births of Iran's Kurdistan province in 2010. **Methods:** Researcher-completed questionnaires captured data on gender, mother's age during pregnancy, parents' occupation, father's birthplace, family background, consanguinity, systemic diseases, mother's disease during pregnancy, drugs abuse, smoking, alcohol drinking, radiography and mother's radiotherapy during pregnancy. **Results:** Of 26,537 newborns, 29 (19 male and 10 females) were affected by various types of cleft lip and palate. Of newborns with cleft lip and palate: 38% had other abnormalities, consanguinity was reported in about 31% of cases and 28% of mothers used prescribed drugs during pregnancy while no mothers used cigarettes or alcohol. There was no report of radiotherapy or radiography. **Conclusions:** The incidence rate of oral clefts was 1.09 in the 1,000 live births.

**Key words:** cleft lip, cleft palate, etiologic factors, incidence, oral clefts

## Introduction

Cleft lip and palate occur when structures in the nose and mouth fail to close during embryonic development. These birth defects appear as openings or incomplete structures in the centre line of the face and mouth. About half of the time they occur concurrently due to the mechanism of damage that leads to these defects (Vanderas, 1987). Cleft lip, with or without cleft palate, is the most common orofacial congenital anomaly among live births (Abramowicz *et al.*, 2003). The oral clefting rate varies between countries, from about 0.5 to 2 per 1,000 births (Marazita, 2002).

The incidence rate of oral clefts in various parts of Iran varies from 0.80 to 2.14 per 1,000 births (Golalipour *et al.*, 2007, Mirfazeli *et al.*, 2012, Jamilian *et al.*, 2007, Khazaei *et al.*, 2011, Rajabian and Aghaei 2005, Yassaei *et al.*, 2010, Zandi and Heidari 2011). Oral cleft incidence in northern Iran was reported to be at 0.97 per 1,000 births during 1998–2003 (Golalipour *et al.*, 2007). The International Prenatal Database of Typical Orofacial Clefts recently reported that the overall incidence of cleft lip with or without cleft palate was 0.99 per 1,000 (IP-DTOC Working Group, 2011). The incidence of cleft lip was 0.33 per 1,000 and that of cleft lip and palate was 0.66 per 1,000 (Vanderas, 1987). There is no report on the incidence of cleft lip and palate in a Kurdish population. Therefore, the aim of this study was to assess the incidence of oral clefts in Iranian Kurd newborns and identify associated factors.

## Method

This prospective descriptive-cross-sectional study was conducted in 12 hospitals with delivery facilities in the Kurdistan province of northwest Iran during the year from 20 March 2010. No attempt was made to include non-hospital births. All newborns participating in this study were of Kurdish ethnicity (judged by self-identification as Kurd by both parents) and non-Kurd newborns were excluded. All newborns at the hospitals were reported by the staff of the gynaecology sections to the researchers. On identifying any newborns with cleft lip or palate, a researcher went to the family home, completed a questionnaire based on the parents' responses and conducted a clinical examination of the infant. One researcher (AZN) carried out the examinations after training by MKS.

The following variables were studied for each patient:

- The presence of cleft lip or palate
- Type of cleft lip or palate (cleft in uvula, soft palate, hard palate, unilateral cleft of palate, bilateral cleft of palate)
- Gender of newborn
- Other obvious anomalies
- Child's birth order
- Family marriage of parents
- Mother's job
- Mother's use of alcohol or recreational drugs
- Disease during pregnancy period
- Prescription drugs used during pregnancy
- Father's job
- Home location

Descriptive statistics were calculated.

## Results

Of the 26,537 newborns in the study, there were 13,394 boys and 13,143 girls. Of these, 29 (19 boys and 10 girls) had cleft lip or palate. The incidence of cleft lip and palate was 1.09 in 1,000 live births: 1.42 in boys and 0.76 in girls (Table 1).

The most frequent cleft with no consideration of its location (unilateral or bilateral) was concomitant cleft of lip and palate (16 individuals, 55%) with unilateral cleft of lip and palate having the greatest single incidence rate (10 cases, 35%). The least frequent cleft was isolated cleft palate (5 individuals, 17%, all but one girls). Isolated cleft lip was observed in 8 newborns (28%). The lowest incidence rate (1 case, 3%) was for cleft of lip and alveolar bone (Table 2).

Some 66% of the families lived in villages. The newborn was the first or second child in 59% of the families, 35% were firstborns. In 10% of the cases the mother, at the time pregnancy, was aged under 21 and 45% were over 30 (Table 3). Fathers were farmers in 38% of cases, 35% were labourers, 14% were drivers. All mothers were housewives. Congenital anomalies in other parts of the body were present in 11 newborns: 6 congenital heart and brain abnormalities; 2 heart abnormalities; 2 with finger abnormalities, one with clubfoot; and, in one case, a brain abnormality. Drug use during pregnancy was reported in 7 cases: 3, antibiotics for kidney and urinary tract infection; 1 each with antibiotics for dental infection, phenytoin for treatment of seizure, ergotamine for treatment of migraine and antipsychotic drugs because of bereavement.

In 21% of the pregnancies, mothers reported suffering a disease: 3 cases of kidney and urinary tract disease and single cases of diabetes, seizure and migraine. Cigarette smoking, alcohol abuse and addiction were not reported by any of the mothers of newborns with cleft. Nor was X-ray radiography or radiation therapy reported during pregnancy. Two mothers suffered trauma during pregnancy, one in a car accident and the other in an assault.

None of the parents had cleft lip or palate. Only in one case, one of the near relatives (uncle) of newborn had cleft. Consanguinity (marriage between relatives) of parents was reported in 31% of cases. In our study, 11 (38%) of the 29 newborns with cleft died later.

## Discussion

Epidemiologic data can prove valuable for planning health care programs besides aiding understanding of abnormalities. Knowing the aetiological factors of clefts can be helpful in prevention. Accordingly, this study was conducted to evaluate incidence of oral clefts and their associated factors in a previously unreported population. The incidence rate of cleft lip and/or palate was 1.09 in 1,000 live births in this Kurdish population.

Studies in northern Iran (Gorgan), report the overall incidence of oral cleft being somewhat lower at 0.97 and 1.05 per 1,000 live births (Golalipour *et al.*, 2007, Mirfazeli *et al.*, 2012). Elsewhere in Iran the rates per 1,000 live births have been reported as 2.14 in Tehran, 1.01 in Hamedan, 0.86 in Yazd and 0.80 in Shiraz (respectively, Jamilian *et al.* 2007, Zandi and Heidari 2011, Yassaei *et*

**Table 1.** Gender distribution of cleft lip and/or palate among newborns in the Kurdish population

Gender	Presence of cleft lip and/or palate per 1,000 births	n
Boy	1.42	19 in 13,394
Girl	0.76	10 in 13,143
All	1.09	29 in 26,537

**Table 2.** Incidence of the different types of clefts

Type of cleft (n=29)	n	%	Cumulative %
Palate	5	17	17
Unilateral lip	3	10	286
Bilateral lip and cleft of alveolar	1	3	310
Bilateral lip without cleft of alveolar	4	14	45
Unilateral lip and palate	10	35	79
Bilateral lip and palate	6	21	100

**Table 3.** Distribution of mothers' age of clefted newborns

Mothers age (years)	n	%	Cumulative %
15-20	3	10	10
21-25	9	31	41
26-30	4	14	55
31-37	13	45	100
All	29	100	-

*al.*, 2010, Rajabian and Aghaei 2005). A meta-analysis of 11 Iranian studies calculated an overall rate of 1.0 and postulated that the high incidence of oral clefts in Tehran may be due to the use of mustard gas during the Iran-Iraq war (Khazaei *et al.*, 2011).

The incidence rates per 1,000 births in Asia are higher than we observed: 1.91 in Pakistan, 1.81 in Korea, 1.76 in Northern China, 1.5 in Oman, 1.39 in Jordan and 1.34 in Japan (respectively, Elahi *et al.*, 2004, Kim *et al.*, 2002, Wang *et al.*, 2009, Rajab and Thomas, 2001, Al-Omari and Al-Omari 2004, Cooper *et al.*, 2006).

The male/female ratio of newborns with cleft was 2.1 in the present study, which is similar to the findings of Mirfazeli *et al.*, (2012) and other studies in Jordan, northern Iran, Korea and Japan (Al-Omari & Al-Omari 2004; Golalipour *et al.*, 2007; Kim *et al.*, 2002; Natsume *et al.*, 2000). Isolated cleft palate being much more common girls agreed with the findings of Kot and Kruk-Jeromin (2003). Different ratios have been reported elsewhere: 2.5 in Korea, 1.0 in Nigeria and 0.6 in Iran (Kim *et al.*, 2002, Obuekwe and Akapata, 2004, Yazdee *et al.*, 2011).

Thirty-one percent of patients in the present study had consanguine parents closely matched the finding of the Yazdee study (2011) but was roughly half the rate of the Ravichandran *et al.*, (2012) study: a discrepancy which can be attributed to racial differences. Jamilian *et al.*, (2007) identified consanguinity as the main risk factor for clefts.

Other abnormalities were observed in 38% of our newborns, rather less than the 66% reported in a Turkish study (Altunhan *et al.*, 2012). Nevertheless there appears to be an association between oral cleft and other abnormalities.

In the present study, 24% of mothers used prescription drugs in the pregnancy period matching the 25% of the Källén study (2003). It should be noted that in most cases mothers used drugs during the most critical early stages of pregnancy before being aware of their pregnancy.

The fathers of 73% of the newborns with clefts were either labourers or farmers: both occupations likely to indicate low socioeconomic status and, from our observations, families with a large number of children. This suggests an association between socioeconomic status and the incidence of oral clefts.

### Conclusion

The incidence rate of oral clefts in this Kurdish Iranian population was 1.09 in the 1,000 live births.

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