Original Article

Epidemiological survey of prematurity in Gonbad-e Kavous in Golestan province

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Abstract

Background and purpose: Prematurity birth occurs when a newborn is born before the thirty seventh week of pregnancy. Preterm birth is the most expensive and the most common health problem. So, the aim of this study was to do epidemiological survey of prematurity in Gonbad-e Kavous in 2010.

Materials and Methods: This sectional- descriptive study was carried out on 172 premature babies with census method. A questionnaire was made with α= 0.873 to collect the data. The data were analyzed with SPSS software, descriptive statistics and Poisson regression.

Results: The incidence of prematurity was 41.04 at live births per 1,000 and the mortality rate of prematurity based on all births at live births per 1,000 was 7.78 in 2009. In 2007 and 2008, the mortality rate of prematurity based on all births at live births per 1000 was 10.74 and 7.08, respectively. The villages of Baghlimara, Gadomabad, Aghabad, Gharemohammadtapeh, Chaighoshan, Agribaghaz, Soltanali, Taghiabad, Gonbad1, Gonbad 6, Bibishirvan had the highest maturity rate in 2009-2010, respectively. The most focused was in the south and southeast villages and broader line villages had the lowest rate of prematurity.

Conclusion: The majority of mothers who had preterm birth did not have appropriate nutrition, economic and social situations. In terms of education, 61% of them were at primary level that can have effect on their knowledge and practice. Therefore, increasing knowledge rate and changing diet in pregnancy care and paying more attention to related organizations in improving their livelihood are recommended.

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1. Introduction

Rate of premature births, those occurring before 37 weeks of gestation, constitutes a major health index in all societies (1,2). Neonatal prematurity is an important challenge for healthcare system, and a common cause of mortality in prenatal and neonatal periods. Prenatal death itself is an important index for a society's health, cultural and economical level (3, 4, 5). Although the exact rate of premature birth is not known, it is estimated that approximately 15% are newborns are born prematurely. Recent decades have observed a rising trend in birth of premature neonates (6). In Iran, the rate is reported by the Ministry of Health to be 16-20 out of 1000 live births, which is still higher than the developed countries. According to a study on the main causes of neonatal mortality using international classification of diseases in Vali-Asr Hospital, Tehran, the 5 major causes of mortality included prematurity and respiratory distress syndrome (38.3%), septicemia (13.6%), and congenital anomalies (11.6%) (4). Improvements in neonatal care have reduced neonatal mortality to a great extent; nevertheless, disability resulting from prematurity has increased and it still constitutes a major risk for cerebral palsy and other long term morbidities. In schooling years, these children have lower physical growth, cognitive function and efficiency, and it appears to continue as long as puberty, thus posing a great problem for the society (7). Despite the recent advances in medical sciences, premature birth is still a notable problem of our society. In addition to economical and mental challenges, it also wastes monetary and human resources. Prematurity is the major cause of prenatal mortality (75%) with long term physical and neurological complications in developing countries (8,9). We undertook the present study in rural areas of Gonbad-e Kavous in 2009 due to the large prevalence of prematurity, uncertainties in the etiologic and demographic factors, and the fact that no previous study has been conducted in this region recently to deal with factors such as planned or unplanned pregnancy, high risk mothers, hereditary and congenital disease history, history of problems in previous pregnancies, sanguine relationship of parents, and lack of information on the epidemiological map.

2. Materials and Methods

This is a descriptive cross-sectional study addressing the epidemiology of prematurity in rural areas of Gonbad-e Kavous in 2009. A total of 172 premature male and female newborns entered the study through a survey. Data were extracted from the familial medical records and interviews with mothers. The validity of the checklist used for data collection was confirmed by opinions of gynecologists/obstetricians. In order to confirm its reliability, the checklist was completed in six randomly selected rural centers and the Cronbach's alpha was found to be 0.378. The checklist inquired about mother's occupation, literacy, mother's ethnicity, nutritional status, family's socioeconomic status, mother's age, parity, pregnancy interval, mother's body mass index, gestation age, high risk mother, history of systemic diseases, history of premature birth and abortion, history of drug and tobacco use, number of prenatal care visits during pregnancy, location and type of delivery, neonate's sex, weight and multiple gestation, neonate's vital status, breastfeeding during the first two hours, neonatal complications and birth rank. Data were analyzed on SPSS software using descriptive statistics (mean, mode, frequency) and multivariate logistic regression model.

3. Results

The incidence of prematurity on the region was 41.04 per 1000 live births, and mortality rate due to prematurity in all births in 2009 was 7.78 per 1000 live births, compared to 10.74 and 7.08 in 2008 and 2007, respectively. In addition, the highest rate of prematurity pertained to villages of Baghli Marama, Gadam Abdad, Agh Abad, Ghareh Mohammad Tappeh, Chay Ghoshan, Agri Boghaz, Soltanali, Taghi Abad, Gonbad 1, Gonbad 6, and Bibi Hsirvan, in decreasing order of frequency. Most premature cases occurred in southern and east-southern villages, with the lowest rate occurring in frontier villages (Table 1).

Table 1. Distribution of frequency of prematurity for each rural region

Village	Live births	Premature cases	Live cases	Expired cases	Rate of premature birth
Agabad	221	14	12	2	63.35
Inche borun	74	1	1	0	13.51
Agri boghaz	143	7	5	2	48.95
Imar mohammad gholi akhund	133	9	6	3	38.63
Imar mola sari	120	3	2	1	25
Baghli marama	291	25	20	5	85.91
Bibi shirvan	248	10	10	0	40.32
Pashmak	169	2	2	0	11.83
Fajr	127	1	1	0	7.87
Taghi abad	216	10	9	1	46.30
Soltanali	186	9	8	1	48.39
Dashli borun	124	2	1	1	16.13
Digcheh	1557	5	4	1	31.85
Hali akhund	146	5	1	4	34.25
Haji ghushan	85	0	0	0	0
Chay ghushan	164	10	9	1	51.55
Kaka	114	3	3	0	26.33
Karand	224	4	1	3	17.86
Gadam abad	262	18	14	4	68.70
Gonbad 1	210	9	9	0	42.86
Gonbad 2	138	4	4	0	28.99
Gonbad 5	100	2	1	1	20
Gonbad 6	216	9	7	2	41.67
Ghare mohammad tappeh	193	10	9	1	51.81
Total	4191	172	139	33	41.04

In this study, 97.1% of mothers were homemakers, 0.6% was workers, 1.7% was clerks and 0.6% had other occupations (Table 2). 6.4% were illiterate, 63.4% had elementary education, 12.8% had middle school education, 15.7% had high school education, and 1.7% had university education.

As for ethnicity, 83.1% were Turkmens, 0.6% was Persians, 12.8% were Sistanis, and 3.5% were Baluchis. Regarding socioeconomic status, 28.5% of families were poor, 52.3% were middle class, and 19.2% had good socioeconomic status. The mean age of mothers in this study, was 25.84 years, and the mean interval between this and the previous pregnancy was 25.23 months (Table 3).

Table 2. Distribution of frequency of maternal background variables

Variables \ Index		Frequency	Percent
occupation	Homemaker	167	97.1
	Farmer	0	0
	Livestock raiser	0	0
	Carpet weaver	0	0
	Worker	1	0.6
	Clerk	3	1.7
	Other	1	0.6
Literacy	Illiterate	11	6.4
	Elementary school	109	63.4
	Middle school	22	12.8
	High school	27	15.7
	Pre-university	3	1.7
Ethnicity	Turkmen	143	83.1
	Persian	1	0.6
	Sistani	22	12.8
	Baluch	6	3.5
	Turk	0	0
	Other	0	0
Socioeconomic status	Poor	49	28.5
	Average	90	52.3
	Good	33	19.2

Table 3. Distribution of frequency of variables affecting prematurity

Variable	Index	Frequency	Percent	Variable	Index	Frequency	Percent
Sanguine relationship of parents	Close	28	16.3	**Pregnancy problems**	Inappropriate weight gain	66	38.4
	Distant	25	14.5		Bleeding or spotting	8	4.7
	No sanguine relation	119	69.2		Hypertension	14	8.1
Genetic and congenital disorders in family	Mental retardation	8	4.7		Hemoglobin < 11	29	16.9
	Thalassemia	1	0.6		Symptoms of preeclampsia	18	10.5
	Congenital deformities	5	2.9		Urinary infection	39	22.7
	TORCH syndrome	0	0		Other	13	7.6
	Other	6	3.4	**Pregnancy planning**	Planned	153	89
History of abortion in previous pregnancies	Once	25	14		Unplanned by woman	5	2.9
	Twice	4	2.2		Unplanned by man	0	0
	Three times	2	1.1		Unplanned by both man and woman	14	8.1
	Four times	1	0.6	**Prenatal care**	More than 6 times	23	13.4
	Total number of previous abortion	32	18.6		6 times	18	10.5
Mother's nutritional status during pregnancy	Poor	35	20.3		Less than 6 times	131	76.2
	Average	71	41.3	**Labor location**	Public hospital	162	94.2
	Good	65	37.8		Private hospital	9	5.2
Child's survival	Live	139	80.8		Other	1	0.6
	Expired	33	19.2	**Drug and tobacco history**	History of tobacco use	5	2.9
Breastfeeding	Yes	128	74.4		History of drug use	20	11,6
	No	44	25.6	**Type of labor**	Normal	107	62.2
High risk	Age > 35 years	8	4.7		C-section	65	37.8
	Abnormal BMI	68	39.5	**Newborn's sex**	Girl	76	44.2
	4 or more pregnancies	20	11.6		Boy	96	55.8
	History of difficult pregnancy	13	7.6	**Background disease**	Anemia	9	5.2
	First pregnancy	77	44.8		Diabetes	28	16.3
	Child less than 3 years old	20	11.6		Tuberculosis	0	0
	History of diabetes in family	8	4.7		Goiter	2	1.2
	Vaginal infection in the beginning of pregnancy	8	4.7		Asthma	3	1.7
	Other	29	16.9		Hypertension	5	2.9
Multiple pregnancy	Single	128	74.4		Cardiac disease	3	1.7
	Twins	41	23.8		Renal disease	1	0.6
	Triplets	3	1.7		Mental disease	4	2.3
History of premature birth	Once	11	6.1		Uterine abnormality	1	0.6
	Twice	2	1.1		Other	16	9.3
	Total number of history of prematurity	13	7.5				

4. Discussion

According to our findings, 97.1% of mothers were homemakers, 0.6% was workers, 1.7% was clerks and none of them were occupied in the farming, livestock breeding, and carpet weaving professions. 0.6% had other occupations. 97.7% of premature births pertained to homemakers. Saadat conducted a study on patients referring to Shariati Hospital, Bandarabbas, to report this figure to be equal to 75.5% (5). 6.4% of mothers with premature birth were illiterate, 63.4% had elementary school education, 12.8% had middle school education, 15.7% had high school education, and 1.7% had university education. Ghahramani reported 7.5% illiteracy, 63.8% below high school diploma, 20% high school diploma and 4.2% higher than high school diploma in mothers (10). A comparison of results reveals that most mothers were educated below high school level, which may affect their awareness. Regarding ethnicity, 83.1% were Turkmens, 0.6% was Persians, 12.8% were Sistanis, and 3.5% were Baluchis. As for socioeconomic status, 28.5% of families were poor, 52.3% were middle class and 19.2% had good socioeconomic status, which indicates that most mothers with premature children have had intermediate and poor socioeconomic status, which may serve as a factor for prematurity.

The mean age of mothers was 25.84 years in our study. Saadat reported 98% of mothers aged below 19 years, 83.9% aged 19-35 years, and 6.4% aged more than 35 years (5). According to Jehan's report, 80.8% of mothers were aged below 20 years, 4.3% were aged 20-24 years, 2.8% were aged 25-29 years, 5.2% were aged 30-34 years, and 6.7% were aged above 35 years (13). The mean number of parity in mothers was 2, with 44.7% of mothers experiencing their first pregnancy. The respective figure in previous reports is 43.3% by Saadat, 39.2% by Moghadamemami, and 50% by Azargoon, indicating almost similar results with the majority of prematurity cases occurring in the first pregnancy (3, 5, 9).

Regarding high risk groups at the onset of care for mothers with premature newborns (172 cases), 4.7% were aged above 35 years, 39.5% had abnormal body mass index, 11.6% had their fourth or more pregnancy, 7.6% had history of difficult pregnancies, 44.8% had their first pregnancy, 11.6% had children under 3 years of age, 4.7% had history of diabetes in their family, 4.7% had vaginal infection at the onset of pregnancy, 5.2% had anemia, 16.3% had diabetes, 0% had tuberculosis, 1.2% had goiter, 1.7% had asthma, 2.9% had hypertension, 1.7% had cardiovascular diseases, 0.6% had renal disorders, 2.2% had mental disorders, and 0.6% had uterine abnormalities. Moghadamemami reported anemia in 9.2%, hypertension before pregnancy in 3.3%, uterine abnormalities in 5.8%, renal disease in 2.5%, diabetes in 0.8%, and cardiac disease in 0%. Ebrahimi reported the rate of premature children to be 25% in diabetic mothers and 3.3% in non-diabetics. Also, the rate of prematurity in mothers with psychological disorders was reported to be 12.5% whereas it was 3.3% in mothers without such history (8,9). Mohammadian reported the history of hypertension with preeclampsia to be 10 times higher in mothers with premature newborns, and 14% of mothers had uterine abnormalities. A comparison of findings indicates that diabetes was the most frequent systemic disease (16.3%) in mothers with premature children (1). However, Moghadamemami reported 0.8% diabetes and found the most common systemic disorder to be anemia. Mohammadian reported hypertension to be 10 times higher in mothers of premature children compared to mothers of term neonates (1, 9). Also, among maternal problems during pregnancy, inappropriate weight gain occurred in 38.4%, bleeding or spotting in 4.7%, hypertension in 8.1%, hemoglobin < 11 in 16.9%, symptoms of preeclampsia in 10.5%, urinary infection in 22.7%, and other problems in 7.6%. Hajian reported that maternal hypertension during pregnancy raised the risk of prematurity by 2.71% (7).

Ebrahimi reported 13.5% preeclampsia in mothers with premature newborns, and also 7.7% prematurity in mothers with different types of infection during pregnancy (8). 44% of mothers with premature children had preterm rupture of membranes. In the study conducted by Moghadam Emami, 19.2% preeclampsia and 9.2% anemia were reported in mothers of premature neonates. Porchzka reported 20.9% premature rupture of membranes and 5.5% preeclampsia (9,12). However, Nancy reported that 77.7% of mothers of premature children had labor problems, the most frequent of which was premature rupture of membranes followed by early labor contractions and preeclampsia (11). Comparing the results indicates that in our study, the most common problem during pregnancy was inappropriate weight gain followed by urinary infection.

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