Factors associated with preterm delivery in women admitted to hospitals in Khorramabad: A case control study

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ABSTRACT

Background: Preterm birth is the leading cause of neonatal mortality and a major public health concern. This study aimed to determine factors influencing preterm labor in women referring to hospitals in Khorramabad in 2009-10. Materials and Methods: This case-control study was conducted on 524 mothers (262 subjects in each group) referring to hospitals in Khorramabad (west of Iran) in 2009-10, selected through consecutive sampling. A questionnaire was completed through interviews for each newborn after being examined. Collected data, were analyzed by using the logistic regression and odds ratios and a significant level of 5%. The logistic regression model sensitivity in detecting cases of preterm labor was 86%. Results: The frequency of preterm labor in mothers under 20 was 5.83 times higher than that in mothers in the age range of 20-35 (CI=2.99, 11.37, and P < 0.001). The odds ratios for preterm birth were highest for multiple pregnancies and preterm delivery in mothers with a history of obstetric complications as preterm delivery, low birth weight, stillbirth and abortion is seen more than that in other mothers. Conclusion: These findings will be useful for medical staff and public health workers in attempting to identification and management of risk factors and unfavorable social environment and provide early intervention to reduce the risk of preterm delivery.

Key words: Delivery, hospital, preterm, women

INTRODUCTION

Preterm birth, defined as childbirth occurring at less than 37 weeks of gestation, is a major determinant of neonatal mortality and morbidity and has long-term adverse consequences for health.[1,2] Preterm Delivery represents 5-10% of the deliveries and is an important cause of perinatal mortality and morbidity.[3] Prematurity is the most important indicator of health, and survival of neonates has a direct relationship with infant weight and gestational age at birth.[4] Approximately 45–50% of preterm births are idiopathic, 30% are related to preterm rupture of membranes (PROM) and another 15–20% are attributed to medically indicated or elective preterm deliveries.[5,6] Of all early neonatal deaths (deaths within the first seven days of life) that are not related to congenital malformations, 28% are due to preterm birth.[7]

Despite the advances in medicine and technology and the increase in baby care, that have considerably reduced the mortality and disability of premature infants, preterm labor is still one of the important risk factors of cerebral palsy and other long-term disabilities. Preterm infants, compared with term ones, are exposed to more respiratory, gastrointestinal complications.[4,8] and due to the increased prevalence of medical disabilities, learning difficulties, and behavioral and psychological problems among surviving preterm infants has raised concerns that these infants may have difficulties in coping with adult life.[9]

Preterm labor occurs in about 5 to 15% of all pregnancies, is the most common cause of mortality (60 to 80%) during the prenatal period, and accounts for 50% of congenital defects.
In the US, 75% of neonatal deaths, except for congenital malformations, are due to prematurity. Various factors contribute to preterm labor some of which are preventable and curable, while in most cases the exact causes of preterm labor are unknown. 

Preterm birth rates available from some developed countries, such as the United Kingdom, the United States and the Scandinavian countries, show a dramatic rise over the past 20 years. 

In developing countries, accurate and complete population data and medical records usually do not exist. The preterm birth in developing countries are influenced by a range of factors and as we know No data have been published on preterm birth factors in Lorestan province and its capital city (Khorramabad), therefore, considering the culture and lifestyle differences between populations; identifying the risk factors of preterm delivery along with appropriate prenatal care and preparation of the medical team for preterm labor clearly reduce the mortality rate in these patients. Therefore, this study aimed to determine factors influencing preterm delivery in women referring to hospitals in Khorramabad in 2009-10.

MATERIALS AND METHODS

This case-control study was conducted on 524 mothers (262 subjects in each group) referring to hospitals in Khorramabad (west of Iran) in 2009-10, selected through consecutive sampling. All of the preterm labor cases in the city were considered as the case group and a group including a term birth for every preterm labor as the control group.

We defined prematurity according to gestational age instead of birth weight, which is the definition that was used in many previous studies. The newborns younger than 37 weeks since the LMP were considered as premature infants and those born between the 37th to 42nd weeks as normal.

A questionnaire was completed for each newborn after being examined. The questionnaires were completed through interviews with the mothers soon after the deliveries when they were able to talk. Questionnaires were completed for the control infants in the same way as well. The interviewers had been trained for completing the questionnaires. The mothers’ occupation, age, and education, use of prenatal care, and birth order were matched in the two groups. Before of gathering data, goals of the study explained to all of mothers and informed consent to participation was obtained from them and ethical principles of the study was approved by the ethical committee of the Lorestan University of Medical Science.

Collected data, were analyzed by using the logistic regression and OR and a significant level of 5%. The logistic regression model sensitivity in detecting cases of preterm labor was 86%.

RESULTS

The results indicated that 125 (23.9%) out of the 524 mothers studied were under 20, 68 (13%) above 35 years of age. Also, 457 cases (87.2%) were housewives, 41 (7.8 %) workers, and 26 (5%) were employees. The details of all gestational complications are presented in Table 2.

Based on the logistic regression test, the variables affecting the increased risk of preterm labor can be considered as follows:

The research findings showed that in terms of age, the frequency of preterm labor in mothers under 20 was 5.83 times higher than that in mothers in the age range of 20-35 (CI = 2.99, 11.37, and $P < 0.001$), showing a statistically significant difference. Also, the frequency was 1.65 times higher in women above 35 in comparison with those between 20 and 35 (CI = 0.64, 4.23, and $P = 0.29$); however, the difference was not significant.

Moreover, the frequency of preterm labor in working mothers was 7.34 times higher than housewives (CI = 2.92, 18.44, and $P < 0.001$), and the difference was significant. The frequency of preterm labor in mothers with a history of low birth weight was 6.97 times higher than the rate
Regarding multiple pregnancies, the frequency of preterm labor in mothers with multiple pregnancies was 117.35 times higher (CI = 14.81, 929.36, and \( P < 0.001 \)), showing a significant difference. A significant difference was found in terms of preterm rupture of membranes (PROM) so that the mothers with PROM had a preterm labor frequency of 5.11 times higher (CI = 2.69, 9.69, and \( P < 0.001 \)).

Additionally, the frequency was higher in mothers with BV with a 5.11 times higher rate and a significant difference (CI = 5.06, 26.24, and \( P < 0.001 \)).

In terms of maternal urinary tract infection, the frequency was 3.43 times higher and statistically significant (CI = 1.03, 11.42, and \( P = 0.04 \)). The rate of preterm labor in mothers with preeclampsia was 4.61 times higher (CI = 1.27, 16.75, and \( P = 0.02 \)), and the difference was statistically significant as well. Regarding mothers with abnormally-shaped uteruses (uterine fibroma presence), the frequency of preterm labor was 6.59 times higher and significant statistically (CI = 1.18, 36.74, and \( P = 0.03 \)). The frequency in the smokers was 2.21 times higher than that in the non-smokers, but the difference was not significant (CI = 0.31, 15.33). The effects of other variables including history of infertility, abortion, etc, on increasing the risk of preterm labor were not found to be significant as shown in Table 3.

### DISCUSSION

In the present study, prevalence of preterm labor in women under 20 was significantly higher than that in those in the age range of 20-35. Moreover, the frequency of preterm labor in those over 35 was 1.65 times higher than that in mothers between 20 and 30 years old. In many studies, the ages below 18 and above 35 have been suggested as a predisposing factor of preterm labor.[10,15] Similar results were obtained in a study conducted in Iraq, so that a significant relationship was found between low maternal ages.[16] Rasheed study indicated that preterm labor rate in mothers below 15 years was significantly higher than that for other mothers[17] and in other study carried out in 2003; mothers under 20 at the time of delivering their second children had a risk of preterm delivery higher than others.[18] The risk of severe medical disabilities increased sharply with decreasing gestational age at birth. This association was true with respect to the risk of having cerebral palsy, mental retardation, and several other disorders and with respect to receiving a disability pension.[9]

In the present study, the frequency of preterm labor in working mothers was 7.34 times higher than housewives and the difference was significant (\( P < 0.001 \)) which is consistent with Christina et al, study that showed Part-time work (≤ 20 hrs a week) was associated with a lower risk of preterm birth [RR, 0.7; 95% confidence interval [CI],
The results of a study by Hedderson et al, demonstrated that the risk of preterm labor in mothers suffering from preeclampsia or chronic hypertension is higher than in other mothers. In the present study, the frequency of preterm labor in mothers with preeclampsia showed a significant difference of 4.61 times higher (P < 0.02). With respect to abnormal uterine shape (presence of uterine fibroma), various studies have indicated a relationship between this complication and preterm labor rate. Our results also revealed that the rate was 6.59 times higher in women with abnormally shaped uteruses and the difference was statistically significant (P < 0.03).

Additionally, Evers study revealed that the prevalence of preterm labor in women with Type 1 diabetes is 32.3% more than that in the general population, and despite the early and appropriate control of blood sugar and use of folic acid, maternal and fetal complications of Type 1 diabetes still show an increase, and controlling blood sugar in a near-to-ideal degree does not seem to be sufficient. In this regard, Hedderson et al, concluded that the risk of spontaneous preterm labor was 4% in those with normal blood sugar during screening while the rate was 6.7% for mothers with pregnancy diabetes. Our study also revealed the rate of 3.44 times higher in diabetic mothers; however, the difference was not significant and it may be due to the low number of diabetic cases in our study. Our study revealed that the preterm labor frequency in smoking mothers was 2.21 times higher; however, this difference was not statistically significant.

Which is consistent within a case-control study by Burquet and Yang Chen study that showed the relationship between smoking and preterm labor, it was revealed that smoking mothers experience preterm labor more, so that in smoking mothers without hypertension, the risk of very preterm labor increased resulting from such mechanisms as PROM, hemorrhage during pregnancy.

Considering that some of the causes of preterm labor are rooted in behavioral and many of these factors are preventable, this study was conducted in a deprived city in west of Iran on a group of female that have different lifestyle of living from whom are living in developed countries and in modern cities, sometimes they are involved in contributing to the family income, Chore and heavy works and some of them living in not favorable health and medicine conditions which they are a large proportion of the female population in less developed countries. Therefore, findings of this
study can help the physicians about preterm delivery with considering to native factors that maybe are deferent in some aspects from foreign textbooks. Also, it can be beneficial to health planners in different levels prevention from preterm delivery in the region.

CONCLUSION

The results show that preterm delivery in mothers with a history of obstetric complications as preterm delivery, low birth weight, stillbirth, abortion, etc, is seen more than that in other mothers. In addition, such problems as multiple pregnancy, PROM, preeclampsia, urinary tract infection, in the present study increased the frequency of preterm delivery. The findings of our study will be useful for parents, medical staff, and public health workers in attempting to identification and management of these risk factors and of unfavorable social environment and detect high risk pregnant women and provide intervention early to reduce the risk of preterm delivery.

The main limitation of the present study was the use of cross-sectional data to determining influencing factors in preterm delivery and further longitudinal analyses will provide stronger evidence in this topic by taking more samples from populations with different characteristics in this region and the country. One of the strengths of the present study is that we had the financial and scientific support of Lorestan University of Medical Sciences and Gynecology Doctors, and the study conducted with matched case and control groups and the sample of individuals studied was larger than that of most previous studies and this strongly reinforces the interest of our results. Moreover, no previous studies have been conducted in this title, so our results extend knowledge on factors influenced preterm delivery in region women.

REFERENCES

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