Brief Report

J Babol Univ Med Sci
Vol 17, Issu 3; Mar 2015; P:7-12

The Comparison of the Risk Factors in the Term and Preterm Delivery

Sh. Yazdani (MD)[1], Z. Bouzari (MD)*[2], S. Akhondi [3], M. Naeimi rad (MSc)[4], R. Khodadad (BSc)[3]

1.Fatemeh Zahra Infertility and Reproductive Health Research Center, Babol University of Medical Sciences, Babol, I.R. Iran
2.Cellular & Molecular Biology Research Center, Babol University of Medical Sciences, Babol, I.R. Iran
3.Babol University of Medical Sciences, Babol, I.R. Iran
4.Development Center of Clinical Research of Rouhani Hospital, Babol University of Medical Science, Babol, I.R. Iran

Received: Jun 21th 2014, Revised: Agu 6th 2014, Accepted: Nov 26th 2014.

ABSTRACT

BACKGROUND AND OBJECTIVE: Premature delivery is the presence of progressive uterine contractions before reaching 37 weeks of pregnancy. Since it is associated with perinatal complications and high costs, this study aimed to study the risk factors for premature delivery.

METHODS: This cross-sectional study was conducted on 377 pregnant women with preterm labor (23-37 weeks) and 423 pregnant women of term delivery referring to Ayatollah Rohani Hospital of Babol city, Iran. We extracted and investigated the subjects' demographic data, history of infertility, smoking habits, use of drugs, fast food consumption, history or presence of maternal illnesses and surgery, Urinary Tract Infections (UTI), Oligohydramnios, intrauterine growth restriction (IUGR), embryonic anomalies, premature rupture of membranes, vaginal bleeding as well as the neonatal data.

FINDINGS: As observed in the two groups of preterm and term delivery respectively, there was employment during pregnancy in 83 (22%) and 51 (12%) cases, a history of preterm labor in 41 (10.9%) versus 21 (5%) cases, bleeding during the first trimester in 118 (31.3%) versus 61 (14.4%) cases, fast food consumption in 34 (9%) versus 14 (3.3%) cases, UTI in 150 (39.8%) versus 111 (26.2%) cases, anemia in 62 (16.4%) versus 29 (6.9%) cases, hypertension in 72 (19.1%) versus 13 (3.1%) cases and finally, smoking habits in 22 (5.8%) versus 5 (1.2%) subjects. There was a statistically significant association between the aforementioned variables ($p<0.05$).

CONCLUSION: According to the results of this study, the most significant risk factors for premature delivery could be managed and controlled.

KEY WORDS: Premature Delivery, Neonates, Risk Factors.

Please cite this article as follows:

Yazdani Sh, Bouzari Z, Akhondi S, Naeimi rad M, Khodadad R. The Comparison of the Risk Factors for Premature Delivery in the Women of Term and Preterm Delivery. J Babol Univ Med Sci. 2015; 17(3):7-12.

Introduction

Premature delivery occurs before the completion of 37 weeks of pregnancy (1). In many industrialized countries, preterm birthrates are experiencing an increasing trend. For instance, the incidence has risen from 5.9% in 1981 to 12.7% in 2005 in the United States of America (2). According to two studies conducted in Tajrish Martyrs Hospital in Tehran and Bandar Abbas, the incidence of premature delivery was reported to be 7.23% and 4.4%, respectively (3, 4). Nowadays, with the remarkable progress in the identification of risk factors and mechanisms associated with premature birth, reducing the rate of

***Corresponding Author: Z.Bouzari (MD)**
Address: Fatemeh Zahra Infertility and Reproductive Health Research Center, Babol, I.R.Iran.
Phone: +98 11 32274881-2
Email: z_b412003@yahoo.com

[DOR: 20.1001.1.15614107.1393.17.3.1.8]
[DOI: 10.22088/jbums.17.3.7]

this condition through medical interventions and public education on pregnancy health has been a primary goal in the field of medicine (2,5). Premature birth is considered to be responsible for 75% of perinatal deaths and it is the sole cause of more than 50% of long-term morbidities.Although many preterm neonates might survive, they will be prone to a severe risk of developmental disorders of the nervous system, respiratory and sensory impairment, learning disabilities and digestive complications (6,7). Thus, several studies have partially examined the risk factors for premature delivery.

In their study, Silveira et al. claimed that such factors as black skin color, lower degrees of education, lower income, teenage pregnancy, history of premature delivery, smoking and employment during pregnancy are likely to significantly raise the risk of premature delivery (8). In another research, Yuan et al. also found that such factors as a history of premature delivery, the mother's age (over 39 years), socioeconomic issues, smoking during pregnancy, hypertension, mental disorders and abnormal uterine are known to be significantly associated with the incidence of premature delivery (9). In another study, these factors were determined as early age, the state of being a single mother, the mother's degree of education, body mass index (BMI), lower income, the history of abortion and a history of premature births (10). For another thing, preterm neonatal births bear a heavy cost on the health care system of a country. Investigating several studies in this regard has revealed that there are differences in the risk factors for premature delivery depending on the geographical situation and racial diversities across the world. Since only a few studies have attempted to survey the risk factors for premature delivery in the city of Babol, this study aimed to evaluate the prevalence of such factors.

Methods

This cross-sectional study was conducted in the maternity ward of Ayatollah Rohani Hospital affiliated with the Babol University of Medical Sciences which is a principal referral center for women with high-risk and premature pregnancies. The sample size was determined on the basis of previous studies. In the present study, 377 pregnant women with premature delivery (23-37 weeks of pregnancy) and 423 sample term pregnant women were enrolled from 2011 to 2013. Upon obtaining permission from the Ethics Committee of the Medical University of Babol, written consent was provided from the subjects. Through interviewing the mothers, the initial maternal data were extracted including the age, gravidity and parity, any history of abortion, BMI, mother's degree of education and occupation, any history of infertility, smoking habits and the use of alcohol and drugs, consumption of fast food (more than twice a week), the age of pregnancy, cervical cerclage, cell phone use, any history of diseases in the mother (e.g anemia, cardiovascular diseases, diabetes, hypertension and thyroid and psychiatric disorders) (11, 12), any history of surgery, Urinary Tract Infections (UTI), Oligohydramnios, intrauterine growth restriction (IUGR), embryonic anomalies, premature rupture of membranes and vaginal bleeding. Eventually, the infants' data were recorded by a neonatal specialist including birth weight, need for resuscitation and hospitalization, 5-minute Apgar scores and the mortality rate of the hospitalized neonates. The collected data were analyzed and compared by SPSS software V.18, T-test, Chi-square, Fisher's exact test and Mann-Whitney. The $p<0.05$ was considered as significant.

Results

In total, 800 pregnant women were enrolled in the present study who were classified into two groups of term delivery (N=423, 52.9%) and preterm delivery (N=377, 47.1%). The mother's demographic features were found to be similar between the two groups. However, there was a statistically significant difference in the age and weight of the embryo between the two groups (table 1).

Table 1. Comparison of maternal and neonatal demographics in the term and preterm delivery group

Pregnancy age / Variable	Term Mean±SD	Preterm Mean±SD	p-value
Mother's age	26.65±5.53	26.91±5.58	0.63
Mother's weight (Kg)	77.81±14.21	77.44±14.36	0.53
Mother's height (cm)	160.07±5.72	160.14±9.79	0.48
BMI(Kg/m^2)	30.277±4.92	30.004±5.33	0.56
Embryo's age	38.59±1.2	33.02±3.12	0.000
Embryo's weight (gr)	3242.01±566.62	2098.30±688.02	0.000

[DOR: 20.1001.1.15614107.1393.17.3.1.8]
[DOI: 10.22088/jbums.17.3.7]

Moreover, the number and frequency of the risk factors for premature delivery were compared in the two groups. According to the obtained results, the most significant risk factors in the two groups of term and preterm delivery were reported to be employment during pregnancy (p=0.000), premature delivery (p=0.002), bleeding within the first trimester (p=0.000), fast food consumption (p=0.001) , UTI (p=0.000), smoking (p=0.000), hypertension (p<0.001) and anemia upon admission (p=0.01). As for other risk factors for premature birth, there was no statistically significant difference between the two groups (table 2).

Furthermore, despite the fact that thyroid disorders were found to be more prevalent among the women of premature delivery, the difference was not considered to be statistically significant. In predicting the risk of premature delivery by the aforementioned factors, it was observed that hypertension and smoking were independently associated with a higher risk of premature delivery (table 2). In addition, the mean Apgar score after 5 minutes was 9.86±0 and 9.04±2.8 in the term and preterm group, respectively. A statistically significant difference was observed between the two groups in this regard (p=0.000).

Table 2. Comparison of Preterm Delivery Risk Factors in Predicting the Risk of Preterm Delivery between the two groups

Variable	Group	N(%)	OR [a] (CI 95%)	p-value	OR [b](CI 95%)	p-value
Working during pregnancy	Premature delivery Term	83(22) 51(12)	2.05(1.40&3.01)	0.000	2.04 (1.35&3.09)	0.001
Abortion	Premature Birth Term	85 (22.5) 75(17.7)		0.089		
History of Infertility	Premature delivery Term	62(16.4) 55(135)		0.16		
History of Premature delivery	Preterm Term	41(10.9) 21(5)	2.33(1.35&4.03)	0.002	2.21(3.98 &1.23)	0.008
Bleeding in the first semester	Premature Birth Term	118(31.3) 61(14.4)	2.70(1.90 &3.82)	0.000	2.68(3.88&1.85)	<0.001
Using Cell phones	Term	306(81.2) 347(82)		0.75		
Fast food consumption	Premature delivery Term	34(9) 14(3.3)	2.89(1.52 &5.48)	0.001	2.73(1.38&5.4)	0.004
Diabetes	Premature delivery Term	49(13) 61(14.4)		0.55		
Thyroid disease	Premature Delivery Term	27(7.2) 18(4.3)		0.07		
UTI	Premature delivery Term	150(39.8) 111(26.2)	1.85(1.37&2.50)	0.000	1.59(1.14&2.21)	0.006
History of surgeory	Premature delivery Term	141(37.4) 157(37.1)		0.93		
Mental Illness	Premature Delivery Term	27(7.2) 31(7.3)		0.92		
Cardiovascular diseases	Premature delivery Term	28(7.4) 29(6.9)		0.75		
Anemia at admission	Premature delivery Term	62(16.4) 112(26.5)	1.07(0.57 &2.01)	0.01		
Uterine anomalies	Premature delivery Term	20(5.3) 21(5)		0.82		
Uterine Cerclage	Premature delivery Term	26(6.9) 18(4.3)		0.1		
Smoking	Premature delivery Term	22(5.8) 5(1.2)	5.18(1.94 &13.82)	0.000	1.79(13.81&4.79)	0.002
Hypertensionre	Premature Delivery Term	72(19.1) 13(3.1)	7.95(1.34 &60.08)	<0.001	8.45(1.02&70.009)	0.048

** OR[a] (Odds ratio Crude), OR[b] (Odds ratio Matched), CI (Confidence Interval)

[DOR: 20.1001.1.15614107.1393.17.3.1.8]
[DOI: 10.22088/jbums.17.3.7]

Discussion

The results of the current study indicated that such factors as employment during pregnancy, a history of premature delivery, first-trimester bleeding, fast food consumption, hypertension, UTI and smoking are among the major risk factors for premature delivery. This is consistent with the study of Silveria et al. (8), Wei Yuan et al. (9) and Buruet et al. (10). In their research, Silveria et al. (8) and DiRenzo et al. (13) stated that a history of premature delivery, smoking and working during pregnancy could significantly raise the risk of premature delivery. However, Silveria et al. (8) did not examine hypertension as a risk factor while Wei Yuan et al. (9) introduced it as a primary risk factor for premature delivery. In the present study, the incidence of premature delivery was significantly higher in the women with hypertensive disorders. On the other hand, Nabavizadeh et al. proved that the rate of premature delivery was 2.3 times higher among diabetic women as well as the patients of cardiovascular diseases (11).

In another study, the major risk factors for preterm delivery were determined as diabetes, age above 35 years, hypertension, cervical incompetence, premature rupture of membranes and a history of premature delivery (12). In the current study, it was observed that the pregnancies which are accompanied with bleeding during the first trimester are likely to result in premature delivery (2.7 times higher than the term delivery group). Consequently, expecting women need to be examined, educated and warned about the signals of an early onset of uterine contractions so that they would stay available for such required interventions as using pain inhibitors. In their study, Davari Tanha et al. considered first-trimester bleeding to be one of the primary causes of premature delivery (14).Moreover, the present study suggested that UTI was likely to significantly raise the risk of premature delivery by 1.85 times in the preterm delivery group compared to the term delivery group. The protease, coagulase and elastase produced by microorganisms could enhance the production of prostaglandin which is a primary factor associated with the incidence of premature delivery. Furthermore, the endotoxins supplied by the prostaglandins directly stimulate the labor. As a result, treating the infections of the lower part of the urinary tract is likely to noticeably reduce the incidence of premature delivery. According to the further results of the present study, consumption of fast foods is well regarded as a risk factor for preterm delivery. Since concrete evidence is scarce on this relationship, further investigation needs to be made in order to discover the primary causes. For another thing, no significant correlations were found between the mother's age and preterm delivery in this study. This finding was inconsistent with those of the study of Wei Yuan et al. (9), Burguet et al. (10), Schmpf et al. (15) and Hammond G et al. (16). All the aforementioned studies indicated that the correlation between the mother's age and premature delivery is associated with the two ends of the age spectrum from below 18 to over 35 years of age while in our study, the majority of the subjects were within this range and the mean age of the population was 26.78±5.68 years.This difference could be due to higher probability of pregnancy within this age range or the smaller sample size in Iran. In their research, Wei Yuan et al. (8) and Davari Tanha et al. (14) determined the presence of uterine malformations as a principal cause of preterm delivery. However, in our study, no significant differences were found regarding the presence or absence of uterine anomalies between the two groups of term and preterm delivery. Such inconsistency might be due to the racial and socioeconomic differences as well as the number of the studied samples. While Schmpf et al. (15) regarded ethnicity and race as important risk factors for premature birth, Wei Yuan et al. (9) introduced socioeconomic issues as the predisposing factor. On the other hand, previous studies (9, 17,18) considered psychiatric disorders as the risk factors leading to preterm delivery while in the present study, no significant differences were found between the two study groups in terms of the presence or absence of psychiatric diseases.

The main difference between our study and other experiments is that in previous studies, psychiatric patients were put into comparison with normal patients in terms of premature delivery. Therefore, it is recommended that future studies be conducted in this regard in a larger sample size and number of health care centers relying on other risk factors of premature birth such as race, history of nervous illnesses and the socioeconomic status of the the expecting mothers. Since the most significant risk factors for premature delivery are manageable, attention needs to be drawn to the more specific risk factors likely to be detected in women with a history of preterm delivery. In addition, such maternal disorders as diabetes, hypertension, thyroid disorders and prenatal care need to be taken into account in this regard.

[DOR: 20.1001.1.15614107.1393.17.3.1.8]
[DOI: 10.22088/jbums.17.3.7]

Acknowledgments

Hereby, we extend our deepest gratitude to the Deputy of Health of Babol University of Medical Sciences and the Clinical Research Development Unit of Ayatollah Rohani Hospital for the financial support of this study. We would also like to thank the staff of the Labor Department of this hospital for assisting us in collecting the samples.

[DOR: 20.1001.1.15614107.1393.17.3.1.8]
[DOI: 10.22088/jbums.17.3.7]

References

1.Varma R, James D. Antenatal care of women with previous preterm delivery Current. Obstet Gynecol. 2004;14(3):207-15.

2.Green NS, Damus K, Simpson JL, Iams J, Reece EA, Hobel CJ, et al. Research agenda for preterm birth: recommendations from the March of Dimes. Am J Obstet Gynecol 2005;193(3 pt 1):626-35.

3.Afrakhteh M, Ebrahimi S, Valaie N. Prevalence of preterm delivery and its related factors in females referring to Shohada Tajrish Hospital, 1995-99. Pejouhandeh. 2003;7(4):341-3. [In Persian]

4.Saadat M. Prevalent causes of premature delivery in Shariati Hospital- Bandar Abbas. Med J Hormozgan Univ. 2001;5(4):19-24. [In Persian]

5.Tekesin I, Eberhart LH, Schaefer V, Wallwiener D, Schmidt S. Evaluation and validation of a new risk score (Cleopatra Score) to predict the probability of premature delivery for patients with threatened preterm labour. Ultrasound Obstet Gynecol. 2005;26(7):699-706.

6.Honest H, Bachmann LM, Sundaram R, Gupta JK, Kleijnen J, Khan KS. The accuracy of risk scores in predicting preterm birth–a systematic review. J Obstet Gynaecol. 2004;24(4):343-59.

7.Selling KE, Carstensen J, Finnström O, Sydsjö G. Intergenerational effects of preterm birth and reduced intrauterine growth: a population based study of Swedish mother–offspring pairs. BJOG. 2006;113(4):430-40.

8.Silveira MF, Victora CG, Barros AJD, Santos IS, Matijasevich A, Barros FC. Determinants of preterm birth: Pelotas, Rio Grande do Sul State, Brazil, 2004 birth cohort. Cad. Saúde Pública (Rio de Janeiro). 2010; 26(1):185-94.

9.Wei Yuan W, Duffner AM, Chen L, Hunt LP, Sellers SM, Bernal AL. Analysis of preterm deliveries below 35 weeks'gestation in a tertiary referral hospital in the UK. A case-control survey. BMC Res Notes. 2010;3:119.

10.Burguet A, Kaminski M, Abraham-Lerat L, Schaal JP, Cambonie G, Fresson J, et al. The complex relationship between smoking in pregnancy and very preterm delivery. Results of the Epipage study. BJOG. 2004;111(3):258-65.

11.Derakhshi B, Esmailnasab N, Ghaderi E, Hemmatpour S. Risk factor of preterm labor in the west of iran: A case-control study. Iran J Pub Health. 2014;43(4):499-506.

12.Nabavizadeh SH, Malekzadeh M, Mousavizadeh A, Shirazi HR, Ghaffari P, Karshenas N, et al. Retrospective study of factors related to preterm labor in Yasuj, Iran. Int J Gen Med. 2012;5:1013-7.

13.Di Renzo GC, Giardina I, Rosati A, Clerici G, Torricelli M, Petraglia F. Maternal risk factors for preterm birth: a country-based population analysis. Eur J Obstet Gynecol Repord Biol. 2011;159(2):342-6.

14.Davari Tanha F, Valadan M, Kaveh M, Bagherzadeh S, HasanzadeM. Risk factors for recurrent preterm delivery in three university hospitals. Tehran Univ Med J. 2008;64(2):24-9. [In Persian]

15.Schempf AH, Branum AM, Lukacs SL, Schoendrof KC. Maternal age and parity–association risks of preterm birth: differences by race/ ethnicity. Pediatr Perinat Epidemiol.2007;21(1):34-43

16.Hammond G, Langridge A, Leonard H, Hagan R, Jacoby P, DeKlerk N, et al. Changes in risk factors for preterm birth in Western Australia. 1984-2006. BJOG. 2013;120(9):105-60.

17.Shahhosseini Z, Abedian K, Azimi H. Role of Anxiety During Pregnancy in Preterm Delivery; Zanjan Univ Med Sci J. 2008;16(63):85-92. [In Persian]

18.Sanchez SE, Puente GC, Atencio G, Qiu C, Yanez D, Gelaye B, et al. Risk of spontaneous preterm birth in relation to maternal depressive, anxiety, and stress symptoms. J Reprod Med. 2013;58(1-2):25-33.

[DOR: 20.1001.1.15614107.1393.17.3.1.8]
[DOI: 10.22088/jbums.17.3.7]