Research Journal of Pharmaceutical, Biological and Chemical Sciences

Investigating the Reasons of Preterm Labor among Visitors of Shariati Hospital in Bandar Abbas during 2012 and 2013.

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ABSTRACT

Preterm labor is a type of delivery occurring prior to 37 weeks of pregnancy completed. The side effects of preterm labor account for the highest rate of infant mortality. According to the body of previous research, about 11% of all deliveries lead to the birth of premature babies. Since there is no solution for preventing preterm childbirth, knowing the effective factors involved in it helps to prevent this problem which causes a high rate of mortality among newly-born babies. Therefore, the present research seeks to investigate the underlying causes of prevalent preterm labor among women who visited Shariati hospital in Bandar Abbas in 2012 to 2013. The present experimental research was conducted through investigating the data registered in the medical files of 1,700 pregnant women who visited Shariati hospital in Bandar Abbas during 2012 and 2013. 897 pregnant women who had a preterm labor were selected in a census and assigned to the treatment group. 803 cases of term labor were selected randomly and acted as the control group. A checklist containing demographic information as well as information about preterm labor and its risk factors was used to collect the data. SPSS19 was used to analyze the data as well as t-test, chi-squared test and Mann-Whitney U-test. Significance level was set at ≤.05. From the investigations, the prevalence of preterm labor was estimated to be 7%. As for the risk factors significant correlations were found for: pre-eclampsia, diabetes, amniotic fluid disorders, placental abruption, preterm labor pain, cervical failure, number of babies in current pregnancy, type of pregnancy, intrauterine growth restriction, presentation, systemic disease, history of intrauterine fetal death, preterm rupture of membranes, uterine anomaly and placenta previa. On the other hand, no significant correlation was found between such factors as the history of abortion, number of pregnancy, mother's age, infant's sex, blood type, recurrent miscarriage and intrauterine fetal death. The chance of preterm labor rises along with cervical failure, preeclampsia, amniotic fluid disorder, IVF, multiple pregnancy and intrauterine growth restriction. Recognizing the risk factors and raising mothers' cooperation and awareness can help to reduce the rate of preterm labor.
Keywords: preterm labor, amniotic fluid disorders, preeclampsia, preterm rupture of membranes, Bandar Abbas.

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INTRODUCTION

Preterm labor is a type of childbirth occurring before the completion of 37 weeks of pregnancy [1]. According to previous research, about 11% of all deliveries lead to preterm labor [2]. Premature babies are among groups with the highest rate of mortality and morbidity [3]. Despite recent advancement in medical child healthcare it needs to be reminded that not all premature babies can be totally saved. Occasionally they get physically or mentally disabled [4]. Undesirable side effects in the majority of these infants due to neural-behavioral disabilities are considered among the most serious socioeconomic problems [5, 6]. There are 4 main reasons for preterm labor in the U.S.:

- Labor due to maternal or fetal indications such as preeclampsia, fetal distress, early pregnancy (as for mother's age), placental abruption, chronic hypertension, placenta previa, unreasonable bleeding, diabetes, RH isoimmunization and congenital anomalies
- Idiopathic preterm labor accompanied by intact membranes (PLP)
- Preterm premature rupture of membranes (PPROM)
- Twin or multiple pregnancy [7].

There exists no solution for preventing preterm labor. Each preventive solution has its own demerits and side effects. Factors affecting preterm labor such as placenta previa (50%), amniotic fluid disorder (38%), immunologic factors such as Antiphospholipid Antibody Syndrome (30%) and cervical failure (16%) are highly prevalent [8]. Knowledge of these factors helps to prevent preterm labor which accounts for the highest mortality rate of infants [9]. Therefore, the present study seeks to investigate the reasons for preterm labor among women who visited Shariati hospital in Bandar Abbas during 2012 and 2013.

METHODOLOGY

This experimental research was conducted through an analysis of 1,700 medical files belonging to women visitors of Shariati hospital in Bandar Abbas in 2012 and 2013. The treatment group selected in a census consisted of 897 women who had a preterm labor (according to sonography, pregnancy age of over 20 weeks and below 37 weeks). The control group was comprised of 803 cases of term labor who were randomly selected (according to sonography, a pregnancy age of 37 to 41 weeks). Among all the medical files investigated in this study, those containing missing data were excluded. Data were collected using a checklist containing demographic information and also information concerning preterm labor and its risk factors. The variables investigated included mother's age, mother's blood type, parity, fetal sex, mother's systemic disease, PPROM, PLP, preeclampsia (pregnancy poisoning), diabetes, recurrent miscarriage, amniotic fluid disorders, intrauterine fetal death (IUFD), history of IDFD, intrauterine growth restriction (IUGR), type of pregnancy, number of babies in current pregnancy, placental preterm abruption, placenta previa, cervical failure and uterine anomalies. The data were analyzed using SPAA version 19. T-test, chi-squared test and Mann-Whitney U-test were used to analyze the data statistically. P-level was set at below .05.

RESULTS

From among the 13,499 childbirths occurring during 2012 and 2013, 949 cases were preterm. The prevalence rate of preterm delivery was estimated to be 7%. The most prevalent factors related to preterm labor are indicated in table 1:

p-level	Confidence interval=95%	Chance ratio	Term delivery (control group) N=803	Preterm delivery (treatment group) N=897	Risk factors	
0.881	0.7678 - 1.3606	1.0221	101(12.6)	115(12.8)	Below 18 years and above 35 years	Mother's age
			702(87.4)	782(87.2)	18-35 years	
0.841	0.8103 - 1.1868	0.9806	379(47.2)	419(46.7)	female	Fetal sex
			424(58.2)	478(53.3)	male	

p-level	Confidence interval=95%	Chance ratio	Term delivery (control group) N=803	Preterm delivery (treatment group) N=897		Risk factors
--	--	ref	196(24.4)	220(24.5)	A	Blood type
0.1969	0.9127 - 1.5579	1.1924	195(24.3)	261(29.1)	B	
0.8880	0.6605 - 1.6145	1.0326	44(5.5)	51(5.7)	AB	
0.3142	0.6945 - 1.1243	0.8836	368(45.8)	365(40.7)	O	
0.182	0.9397 to 1.3872	1.1417	307(38.2)	371(41.4)	nulliparity	parity
			496(61.8)	525(58.6)	multiparity	
0.127	0.4351 to 150.5664	8.0935	0(0)	4(0.4)	yes	IUFD
			803(100)	893(99.6)	no	
<0.001	5.3034-13.1832	8.3616	22(2.7)	171(19.1)	yes	Pre-eclampsia
			781(97.3)	726(80.9)	no	
<0.001	0.5166-0.7664	0.6296	534(66.6)	499(55.6)	yes	PLP
			268(33.4)	398(44.4)	no	
0.023	1.0322-1.5236	1.2541	301(37.5)	385(42.9)	yes	PROM
			502(62.5)	512(57.1)	no	
<0.001	2.3403-3.8689	3.0090	567(70.6)	788(87.8)	no	diabetes
			236(29.4)	109(12.2)	yes	
<0.001	2.4398-7.5914	4.3037	15(1.9)	68(7.6)	yes	Placental abruption
			787(98.1)	829(92.4)	no	
			798(99.4)	880(98.1)	no	

p-level	Confidence interval=95%	Chance ratio	Term delivery (control group) N=803	Preterm delivery (treatment group) N=897		Risk factors
0.04	1.0118-1.7105	1.3156	113(14.4)	159(17.7)	yes	History of abortion
			690(85.9)	738(82.3)	no	
0.01	1.2777-6.353	2.8491	8(1)	25(2.8)	yes	IUFD history
			795(99)	872(97.2)	no	
_	_	Ref	789(98.3)	897(94.4)	natural	Type of pregnancy
0.0071	1.2816 - 4.8462	2.4922	12(1.5)	34(3.8)	Medical intervention	
0.0094	1.6129 - 30.7	7.0368	2(0.2)	16(1.8)	IVF	
<0.001	2.7968-5.5287	3.9323	46(5.7)	173(19.3)	malpresentation	presentation
			757(94.3)	724(80.7)	cephalic	
_	_	Ref	792(98.6)	801(89.3)	no	Amniotic fluid disorder
<0.001	4.3817-17.6294	8.7890	9(1.1)	80(8.9)	oligohydramnios	
0.0059	1.8128-34.5159	7.9101	2(0.2)	16(1.8)	polyhydramnios	

<0.001	4.8062 - 20.8001	9.9985	8(1)	82(90)	2 or more	No. of fetus
			795(99)	815(90.9)	one	
0.021	1.1308-8.385	3.0793	5(0.6)	17(1.9)	yes	Uterine anomaly
			797(99.4)	880(98.1)	no	
<0.001	2.711-48.6324	11.4822	2(0.2)	25(2.8)	yes	Cervical failure
			801(99.8)	872(97.2)	no	
0.690	0.3277 - 9.8209	1.7940	2(0.2)	4(0.4)	yes	Recurrent miscarriage
			801(99.8)	893(99.6)	no	
0.020	1.1323-8.3955	3.0832	5(0.6)	17(1.9)	yes	Placenta previa
			798(99.4)	880(98.1)	no	
<0.001	2.2107-14.7648	5.7132	5(0.6)	31(3.5)	yes	IUGR
			798(99.4)	866(96.5)	no	
0.004	1.1202-1.8105	1.4241	139(17.3)	206(23)	yes	Mother's systemic disease
			664(82.7)	691(77)	no	

According to the results of t-test and chi-squared test as well as Mann Whitney U-test, a significant correlation was found between preterm labor and the following factors: pre-eclampsia (p≤.001), diabetes (p≤.001), amniotic fluid disorders (p≤.001), placental abruption (p≤.001), preterm labor pain (p≤.001), cervical failure (p≤.001), number of fetus in current pregnancy (p≤.001), type of pregnancy (p≤.001), IUGR (p≤.001), presentation (p≤.001), systemic disease (p≤.004), IUFD history (p≤.008), PPROM (p≤.023), uterine anomaly (p≤.021) and placenta previa (p≤.02). no such significant correlation was, however, found between preterm labor and: history of abortion (p≤.118), no. of pregnancies (p≤.182), mother's age (p≤.156), fetal sex (p≤.771), blood type (p≤.098), recurrent miscarriage (p≤.69) and IUFD (p≤.127). 12.8% of mothers in the preterm labor group were at the age of below 18 and above 35 years. 87.2% of them belonged to the 18-35 age group. In the control group, on the other hand, 12.6% belonged to the below 18 or above 35 age group while 87.4% were in the 18-35 age range. According to table 1, subjects whose blood type was O (40.7%) comprised the highest prevalence of preterm labor while the lowest prevalence was found in those whose blood group was AB (5.7%).

DISCUSSION

Etiology of preterm labor is among the most interesting issues in midwifery today [10]. Due to the significance of mortality and morbidity among premature infants, a myriad of research has been conducted so far to investigate the risk factors involved in preterm labor [9]. The following factors were investigated: mother's age, no. of pregnancies, fetal sex, no. of fetus in current pregnancy, mother's BGRH, mother's systemic disease, fetal presentation, amniotic fluid disorders, preterm labor pain, cervical failure, uterine anomaly, placenta previa, IUGR, IUFD, history of IUFD, PPROM, history of abortion, diabetes, preeclampsia. Sohrabi [11], Ananth [12], Jacobson and Covarrubias [13, 14] found age as the risk factor of preterm labor. In the present research, however, no such significant correlation was observed between the treatment and the control group which was consistent with Bayat Mokhatri's study [9]. In the present study, moreover, a significant correlation was found between preterm labor and preeclampsia (p≤.001). The chance of preterm delivery among mothers afflicted with preeclampsia was 8.3616 times as high as those without preeclampsia (95%cl 5.3034 – 13.1832). This finding was consistent with that of Goldenberg in 2008 [15]. Similarly, in this study, a significant correlation was found between preterm labor and the history of abortion (p≤.04). In the treatment group there were 159 subjects (17.7%) while in the control there were 113 subjects (14.4%) with a history of abortion. The probability of preterm labor among women with a history of abortion was 1.3156 times as high as those without any history of abortion. This finding was similar to that of Sorensen and Feresu

[16, 17]. However, no such significant correlation was found in Lotfalizade et al.'s study [18]. With regard to PROM in current pregnancy, we found a significant difference in this study (p≤.023) in the treatment group 42.9% and in the control group 37.5% of subjects had a preterm rupture of membranes. The probability of preterm labor in women who had this latest problem was 1.2541 times as high as those with intact membranes. In Flint and Steer's research in 1999 also a significant correlation was found [19]. In our study, amniotic fluid disorders (oligohydramnios and polyoligohydramnios) were correlated with a rise of preterm labor. Fetuses afflicted with oligohydramnios before 37 weeks of pregnancy had an 8.7890-time increase in preterm labor as compared to the group without oligohydramnios. In fetuses afflicted with polyoligohydramnios, this rate was 7.9101 as high. In Sohrabi et al.'s study, polyoligohydramnios was also recognized as a risk factor of preterm labor [11]. This was consistent with Drapers' study [20]. Investigations conducted by Ananth et al. [14], Mais et al. [21] and Zafarghandi in 2004 [22] indicated an increase of preterm labor as correlated with placental abruption. Similarly, in the present study the chances of preterm delivery in women who had experienced placental abruption or placenta previa were 4.3037 times as high as others (95%cl =2.4398. 7.5914). A significant correlation was found in this research between preterm labor and placenta previa (p≤.020). The chances of preterm delivery in women with placenta previa was 3.0832 times as high as those without any (95%CL=1.1323-8.3955). This was in line with the findings of Lotfalizadeh et al. in 2002-3 [18]. In this study, 41.4% of nulliparities as well as 58.6% of multiparities had a preterm childbirth. On the other hand, 38.2% of nulliparities as well as 61.8% of multiparities had a term delivery. However, no statistically significant divergence was found between nulli- or multi-parity and preterm labor (p=.182). This was similar to Peacock's finding [23]. However, a significant correlation was found in Dr. Mohammadian's study [24]. In this study, preterm uterine contractions were reported to be the predictors of preterm labor (p≤.001). This was consistent with the findings of Lam et al. in 2002 [25] as well as Rajaeefard et al. in 2010 [26]. In this study, from among 897 women with preterm labor, 847 (94.4%) had become pregnant naturally and without any intervention. 16 had got pregnant through IVF. The probability of preterm labor in the latter group was 7.4522 times as high as the former. (95% cl =1.708 − 32.515). Wisborg et al. in 2010 found a significant correlation between IVF and an increased risk of preterm delivery [27] which is similar to our finding. In the present study, 4 subjects (.4%) had an IUFD fetus. This had not occurred among women in the control group. No statistically significant correlation was found between preterm labor and IUFD (p=.0127). However, in Morken et al.'s study in 2008, IUFD with a prevalence of 5.2% was found to be correlated with preterm labor [28]. Other fetal factors such as intrauterine growth restriction were observed in 31 (3.5%) women who had a preterm labor as well as in 5 (6%) women with a term delivery. Statistical tests showed that the chance of preterm labor in women who had intrauterine growth restriction was 5.7132 times as high as those who did not (95%CL=2.2107 − 14.7648). This correlation was also found in Zafaraghandi et al.'s study as well [22]. In this study, mother's systemic diseases such as diabetes, high blood pressure, thyroid diseases, anemia and asthma were found to be correlated with an increased preterm delivery (OR=1.4241, 95%cl=1.1202-1.8105). This was consistent with the research findings of Goldenberg et al. in 2008 [15]. According to the results of the present paper, various uterine anomalies such as the existence of septum is correlated with an increased rate of preterm delivery. The probability of preterm labor among women with such anomalies is 3.0793 times as high as those void of any (95%cl=1.1308- 8.385). As Jakobsson et al. also found in 2007, uterine anomalies are correlated with an increased rate of natural preterm delivery [29]. Cervical failure has been recognized as a key risk factor (p≤.001). In the preterm delivery group there were 25 subjects while in the term delivery group there were 2 subjects with cervical failure. The chance of preterm delivery in those with cervical failure was 11.4822 times as high as those without any (2.711- 48.6324=CL%95). In the other body of research also the short length of cervix has been recognized as a risk factor for preterm labor [30-32]. In 2008, Morken et al. found out that multiple pregnancy is a key factor in preterm labor [28]. In this study, the probability of preterm delivery of twins was found to be 5.7132 times as high as the delivery of single babies (95%CL=2.2107 − 14.7648). In the present study, 19.7% of the treatment group as well as 5.7% of the control group had a malpresentation. The chances of preterm delivery in this group was 3.9323 times as high as those with a cephalic presentation. This was consistent with the findings of Buekens's study in 1994 [33]. However, no significant correlation was found in Beigi et al.'s study between preterm delivery and presentation [34]. In this study, the frequency of male infants in the preterm delivery group was 53.3% while the frequency of female infants was 46.7%. In the term delivery group, on the other hand, the former was estimated to be 52.8% and the latter was 47.2%. No significant correlation was found between preterm labor and fetal sex despite the higher prevalence of male infants compared to females (p≤.841). This was consistent with Dr. Mohammadian's finding. However, in Astolfi's study, the probability of preterm labor of boys was found to be higher than girls [35].

CONCLUSION

According to the findings of the present study, the prevalence of preterm labor during 2012 and 2013 in Shariati hospital of Bandar Abbas was estimated to be 7%. Moreover, the most determining risk factors of preterm delivery were found to be respectively: cervical failure, amniotic fluid disorders, preeclampsia, IVF pregnancy, multiple pregnancy, intrauterine growth restriction and placental abruption. Since some of these factors are preventable such as preeclampsia, diabetes, multiple pregnancy as well as medical diseases such as anemia and thyroid diseases, we hope recognition of people at risk and raising the awareness of mothers and instructing them properly can help to prevent or reduce these factors. It can be a step towards decreasing the occurrence of preterm labor which accounts for the mortality of infants. It can also cut down on the high medical costs involved.

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