

Assessment of risk factors of prematurity among neonates born in Bandar Abbas Shariati Hospital

R. Goudarzi, MD¹ S. Naderi, MD¹ H. Saadat, MD¹ S. Zare, PhD² S. Soleimani, MD³ S. Tavakoli, MD³

Assistant Professor Department of Pediatrics¹, Pediatrics Clinical and Developmental Research Center, Associate Professor Department of Community Medicine², General Practitioner³, Hormozgan University of Medical Sciences, Bandar Abbas, Iran.

(Received 19 May, 2013 Accepted 27 Aug, 2013)

ABSTRACT

Introduction: Prematurity remains the main cause of mortality and morbidity in infants and a problem in the care of pregnant women world-wide. This study describes the risk factors for having a live preterm delivery in Bandar Abbas Shariati Hospital.

Methods: In this case-control study, we studied 300 neonates who were born in Shariati hospital in 2011 and divided them into two groups: case group (100 mothers with premature neonates) and control group (200 mothers with term infants). Risk factors that were studied include maternal age and job, parent's knowledge, the history of preterm birth, uterine abnormality, maternal systemic and infectious disease, prenatal care, placental abnormality, trauma in pregnancy, maternal low weight gain in pregnancy, the number of previous pregnancy, inter pregnancies gap, maternal smoking, membrane abnormality, previous abortion, pregnancy with assisted reproductive therapy. Data collection and analysis were performed using SPSS 16 and t-test and Chi-Square were used to analyze the significance of the results.

Results: The results show that in mothers with preterm birth, prolong premature rupture of membrane 27.92 times, uterine and cervical anomaly about 15 times, preeclampsia 5.26 times, the history of preterm birth 4.96 times, family dependency 2.67 times, urinary tract infection 2.24 times and diabetes 2.18 time more exposed to prematurity than mothers with term birth ($P < 0.05$).

Conclusion: According to this study prolong premature rupture of membrane, uterine and cervical anomaly, preeclampsia and history of preterm birth are the most important risk factors for preterm delivery.

Correspondence:
S. Naderi, MD.
Pediatrics Hospital, Hormozgan
University of Medical Sciences.
Bandar Abbas, Iran
Tel: +98 917 3613154
Email:
salmanaderi@gmail.com

Key words: Delivery - Premature Infant - Term Infant

Introduction:

Preterm is one of the major reasons for neonates mortality and morbidity in the world. With the exception of malformations, Prematurity is the cause of 75% of prenatal mortality and 50% neurologic morbidities (1), according to world health organization.

The alive neonate born before the 37th week from the first day of last menses is considered premature neonate. The Prevalence of prematurity is different in various societies.

During past 20 years, this rate has raised from 9.5% in 2003 to 12.3% in 2003. Although its rate is reported 1 to 8 in America, in America, in African-American population is 1 to 6 (3). Based

on studies in Iran, the prematurity outbreak has been 5.5% in Shiraz (4) and 8.2% in Arak (5). The probability for return of premature parturition in next pregnancies is 19.9% in blond women and 26% in blacks (6). The reasons of preterm delivery can be divided into 3 general groups.

Pontaneous premature rupture of membrane-pregnancy completion in medical reasons. The prevalence in each of the reasons is 8.5%-51.2%, 27.9%-65.4%, 20%-38.3% respectively (2). The most reasons for medical termination of preeclampsia pregnancy include foetus distress, intrauterin growth retardation, rupture of placenta and prematurity of placenta (7).

Prematurity Symptoms consisting short-term and long-term are significant in the birth of premature neonate. From short-term symptoms standpoint, we can point out respiratory distress syndrome, idiopathic apnea of premature neonates, intra ventricular hemorrhage, necrotizing enterocolitis, hypocalcemia, hypothermia, sepsis and cardiovascular disorders (8). But there are long-term symptoms affecting unfavorably on the life process including: lung chronic disease, retinopathy of prematurity, hearing disorders (9), various hospitalizations due to respiratory infections, initial hypertension in maturity (10), enhancing resistance to insulin (12), increasing psycho-mental issues and teeth dysplasia (13,14).

The premature delivery has no absolute treatment and none of the controlling methods of premature delivery is completely effective, having potential symptoms for mother and foetus (15). For example using tocolytic medicines can be accompanied with fetal symptoms in pregnant women (16). Also taking β -agonist by stimulating adrenergic in other parts of body like heart except myometer can be followed by side effects (17).

Hence, premature neonate birth is one of the important struggles in neonate cares. The most death within neonate period is seen in premature neonates. The prematurity birth affects not only the neonate and parents, but also on the health organization because it covers great spends due to several month cares of neonate present in hospital and solving this problem (18). Therefore, the prevention of prematurity in society can lead to improvement of economic status.

In this study, we decided to investigate risk factors of premature births in Bandar Abbas Shariati hospital in order to prevent and treat the most current effective factors in premature delivery.

Methods:

In the case-control study in Bandar Abbas Shariati hospital in 2011, two case and control groups entered the study, the case group included 100 mothers with premature neonate and control group included 200 mothers with term neonate, all risky factors about premature neonate birth were analyzed in both groups. The entrance criterion to this study was maternal pregnancy age (the first day of last menses)

The exit criterion from this study were:

1. Mothers who don't remember this date
2. Cases of foetus mortality in uterus
3. Foetuses with congenital disorders

Sampling was done in a simple method. The born neonates with maternal pregnancy age in lower than 37 weeks of last menses and 37-42 weeks of pregnancy age were considered as premature neonates.

In this study, the researcher made questionnaire was used to collect data including, maternal age variables, history of premature neonate parturition, anatomic disorder of uterus, cervix, maternal diseases, pregnancy cares, abortion history in the second 3 months of pregnancy, the interval between 2 pregnancies, multioara, hydroamnios or oligohydroamnias, smoking, maternal low weight gain. During pregnancy, trauma history in pregnancy, infectious diseases of mother, chorioamnionitis, premature rupture of membrane and pregnancy in artificial method were recorded. Also, the questionnaire consisting demographic characteristics and problems related to mother before or during pregnancy, foetus and placenta. The questionnaire were completed by interviewing with the mothers and analyzing delivery cases, and written satisfaction was taken from mothers before completing the questionnaire.

SPSS software was used for data analysis. Risk factors in both groups, was compared using descriptive-statistical (frequency, mean, standard

deviation) and statistical test, such as t-test and Chi-Square.

Results:

This study was done for 100 mothers with premature neonate birth and 200 mothers with term neonate birth in which premature infants were born before 37 weeks of pregnancy from the first day of last menses and term infants in 37-42 weeks of pregnancy.

In this study, the age mean of pregnant women in group with premature birth neonate were 27.32 ± 6.21 years and in another group with term infant birth, 25.9 ± 5.74 years. In mothers with term infant, 4% of them were under 17, 11% above 35 and 85% between 17 and 35 which statistically no significant difference was observed in two groups.

The mean birth rank in mothers with premature infants were 2.28 ± 1.41 and the opposite group 2.24 ± 1.38 . The average pregnancy interval in the first group was 31.57 ± 3.63 months in the second one, 29.32 ± 3.14 months without no meaningful relationship.

In this study, no significant relation was observed between maternal age and premature neonate birth ($P=0.66$). Whereas, there was a significant correlation between education level of the parents and premature neonate birth ($P=0.6$). Based on related results, the individuals with history of prematurity, expose to premature neonate birth 4.96 times more [OR =4.96 (95% CI 1.65-14.92)] which this proportional risk is statistically significant.

In this research, the mothers with premature birth and mothers with term infant suffered from uterine and cervical anomaly about 7% and 0.5% respectively leading to expose mothers to prematurity almost 15 times more ($P<0.05$) [OR=14.9(95% CI 8.22-18.42)]. Also in this

study, mothers with diabetes 2.18 times (95%CI: 1.02-4.66) more exposed to prematurity ($P<0.05$). [Or considerable impact on prematurity [OR= %95 CI 1.02-4.66)]. Chronic blood pressure had no considerable impact on prematurity [OR=0.79 (95% CI 0.15-4.18)] also thyroid disease weren't associated to prematurity [Or=0.79 (95% CI 0.15-4.18)]. The obtained results showed that there was a significant relationship between preeclampsia and premature neonate birth. Based on these results, the patients with preeclampsia exposed to prematurity 5.26 times more ($P<0.05$) [OR=5.26 (95%CI 1.95-14.16)].

No significant relationship was observed between vaginitis and prematurity [OR=2.22 (95% CI 0.88-5.08)] while women with urinary tract infection exposed to prematurity 2.24 times more [OR=2.24 (95%CI 1.29-3.89)] which was significant statically.

The pregnancy cares ($P=0.13$), previous abortion history ($P=0.53$) and oligohydramnios ($P=0.09$) had significant effect on prematurity (Table 1).

Table 1. Risk frequency in premature neonates in two groups

| Risk Factor | Condition | Case (n=100) | Control (n=200) | P-value |
|-------------------------------|-----------|---------------------|---------------------|---------|
| | | Frequency (Percent) | Frequency (Percent) | |
| Premature rupture of membrane | Yes | 22 (22%) | 2 (1%) | 0.00 |
| | NO | 78 (78%) | 198 (99%) | |
| Uterine and cervical anomaly | Yes | 7 (7%) | 1 (0.5%) | 0.01 |
| | No | 93 (93%) | 199 (99.5%) | |
| History of preterm birth | Yes | 16 (16%) | 8 (4%) | 0.004 |
| | No | 84 (84%) | 192 (96%) | |
| Preeclampsia | Yes | 16 (14%) | 6 (3%) | 0.008 |
| | No | 84 (84%) | 194 (97%) | |
| Diabetes | Yes | 15 (15%) | 15 (7.5%) | 0.002 |
| | No | 85 (85%) | 185 (92.5%) | |
| Family dependency | Yes | 35 (35%) | 40 (20%) | 0.005 |
| | No | 65 (65%) | 160 (80%) | |
| Urinary tract infection | Yes | 33 (33%) | 36 (18%) | 0.004 |
| | No | 67 (67%) | 164 (82%) | |

Table 2. Odds ratio and confidence interval of the risk factors

| Risk Factor | Confidence Interval (95%) | Odds Ratio | P-value |
|--------------------------|---------------------------|------------|---------|
| History of preterm birth | 1.65-14.91 | 4.96 | 0.66 |
| Maternal blood pressure | 0.43-2.09 | 0.95 | 0.79 |
| Thyroid Disease | 0.15-4.18 | 0.79 | 0.79 |
| Vaginitis | 0.88-5.08 | 2.22 | 0.13 |
| Urinary infection | 1.29-3.89 | 2.24 | 0.53 |

Conclusion:

This study has analyzed risk factors in Bandar Abbas Shariati reference hospital.

Based on the results, premature rupture of membrane and following preeclampsia were the most current in prematurity.

In spite of advances in gynecology, premature neonate birth is still known as a great health problem and prematurity is the principal cause for infant's mortality and morbidity posing various reasons in different studies (19).

In this study, midwifery factors like premature rupture of membrane (27.92 times) and preeclampsia, (5.26) were important at factors in prematurity. In many other studies done inside or outside the country, this factor was mentioned as a risk of superior factors in prematurity (20-23).

Uterus disorders is one of the important reasons in prematurity in this study. Indicating enhancement of preterm delivery 15 times more. The similar results were found in studies done in Gaza and Micicipi (24,25).

In a research in Golestan, mothers expose to preterm delivery by this factor 33 times more (26).

The history of premature neonate birth as a risk factor leading to prematurity 4.96 times more. This issue has been underlined in other various studies (24,27). In a study done by Mellissa et al. On 18000 pregnant women during 15 years, returning prematurity is posed as a remarkable risk factor in prematurity (6).

In spite of common points, there were differences between this study and others.

In most post surreys, in spite of our study, there was an important association between low cares of pregnancy and premature birth including study in

Porto with pregnancy cares lower than 6 times (23), in Gaza with limited visits in pregnancy period (24) in Birjand with pregnancy cares lower than 4 times (OR=4.5) (27). Seemingly this harmony is due to regardlessness of the frequencies of pregnancy cares. Because in this study due to lack of evidence indicating times of pregnant visit even a reference is Considered as positive pregnancy care.

In this study parental relative relation in the mothers with prematurity was 2.67 times more than the mothers with mature infant birth which is a meaningful association while this factor has not been evaluated in previous investigations yet.

Also, there was a considerable association between urinary infections, maternal diabetes and prematurity which in none of the studies, these factors has been analyzed and in most studies, maternal diseases were totally effective factors in premature birth.

In researches, maternal age, career and abortion history have no significant association with prematurity.

While there was a meaningful relationship between maternal age and previous premature neonate birth in Gaza study. The number of mothers in Gaza study were 2 times more than those in our study but the opposite result was obtain (24). Perhaps this theory is concerned with the individual culture in any region and marriage age and pregnancy influencing maternal group with mature neonate birth. Most referents to Bandarabbas shariati center are individuals with low Socio-economic status without a special job.

In performed investigations, two pregnancy intervals had no relationship with premature birth. In our study, many studied women have experienced the first pregnancy and two pregnancy intervals was zero.

Regarding to the obtained result due to effect of history in premature neonate birth on prematurity, it can be avoided by identifying mothers with prematurity history with pregnancy cares, rising maternal information about risk of returning premature delivery, symptoms and related consequences and emphasizing the importance of pregnancy cares. Urinary infections, the effect of preeclampsia and diabetes on premature neonates to screen and treat urinary infection are highly recommended.

Acknowledment:

The authors of this article appreciate all mothers who participated in this study and employees of Bandar Abbas Shariati hospital cooperate friendly with us.

References:

1. Passini R Jr, Tedesco RP, Marba ST, Cecatti JG, Guinsburg R, Martinez FE, et al. Brazilian multicenter study on prevalence of preterm birth and associated factors. *BMC Pregnancy Childbirth*. 2010;10:22.
2. Ananth CV, Vintzileos AM. Epidemiology of preterm birth and its clinical subtypes. *J Matern-Fetal Neonatal Med*. 2006;19:773-782.
3. Ashton D. Prematurity-infant mortality: the scourge remains. *Ethn Dis*. 2006;16:58-62.
4. Pourarian SH, Vafafar A, Zare Z. The incidence of prematurity in the hospitals of Shiraz University of Medical. *Science*. 2003;28:19-26.
5. Afrakhteh M, Ebrahimi S, Valaie N. Prevalence of preterm delivery and its related factors in females referring to shohada tajrish hospital. *Pajouhande Quarterly Research Journal*. 2003;30:330-341. [Persian]
6. Adams MM, Elam-Evans LD, Wilson HG, Gilbertz DA. Rates and Factors Associated With Recurrence of Preterm Delivery. *JAMA*. 2000;283:1591-1596.
7. Ananth CV, Vintzileos AM. Maternal-fetal conditions necessitating medical intervention resulting in preterm birth. *Am J Obstet Gynecol*. 2006;195:1557-1563.
8. Randis TM. Complications Associated with Premature Birth. *Virtual Mentor*. 2008;10:647-650.
9. Bracewell MA, Hennessy EM, Wolke D, Murlow N. The EPICure study: growth and blood pressure at 6 years of age following extremely preterm birth. *Arch Dis Child Fetal Neonatal Ed*. 2008;93:108-114.
10. Odberg MD, Sommerfelt K, Markestad T, Elgen LB. Growth and somatic health until adulthood of low birthweight children. *Arch Dis Child Fetal Neonatal Ed*. 2010;95:201-205.
11. Swamy GK, Ostbye T, Skjaerven R. Association of preterm birth with long-term survival, reproduction, and next-generation preterm birth. *JAMA*. 2008;299:1429-1436.
12. Hovi P, Andersson S, Eriksson JG, Järvenpää AL, Strang-Karlsson S, Mäkitie O, et al. Glucose regulation in young adults with very low birth weight. *N Engl J Med*. 2007;356:2053-2063.
13. Hall J, Wolke DA. Comparison of prematurity and small for gestational age as risk factors for age 6-13 years emotional problems. *Early Hum Dev*. 2012;88:797-804.
14. Marinela P. Prematurity and low weigh at birth: risk factors for defects of enamel development. *The Journal of Preventive Medicine*. 2002;10:24-30.
15. Berghella V, Haas S, Chervoneva I, Hyslop T. Patient with prior second trimester loss: prophylactic cerclage or serial transvaginal sonogram? *Am J Obstet Gynecol*. 2002;187:747-751.
16. Caritis S. Adverse effects of tocolytic therapy. *BJOG: an International Journal of Obstetrics and Gynaecology*. 2005;112:74-78.
17. Fabry IG, Paepe PD, Kips JG. The influence of tocolytic drugs on cardiac function, large arteries, and resistance vessels. *European Journal of Clinical Pharmacology*. 2011;67:573-580.
18. Tucker J, McGuire W. Epidemiology of preterm birth. *BMJ*. 2004;329:7467-7475.
19. deAlmedia AC, de Jesus AC, Lima PF, de Araujo MF, de Araujo TM. Maternal risk factors for premature births in a public maternity hospital in Imperatriz-MA. *Rev Gaucha Enferm*. 2012;33:86-94.
20. Shingairai A, Siobau D, Harlow Godfrey B. Risk factors for prematurity at Harare maternity hospital. Zimbabwe. *Int J Epidemiol*. 2004;33:1194-1201.
21. Covarrubias LO, Aguirre GE, Chapuz JR. Maternal factors associated to prematurity. *Ginecol Obstet Mex*. 2008;76:526-536.
22. Pourarian SH, Vafafar A, Zareh Z. The incidence of prematurity in the hospital of Shiraz University of Medical Sciences and Health Services. *Journal of Iran University of Medical Sciences*. 2002 ;28:19-26.
23. Namakin K, Sharifzadeh GH, Molki zade A. To identify the risk factors in prematurity birth in Birjand, Iran: A case-control study. *Iranian Journal of Epidemiology*. 2011;7:1-5. [Persian]
24. Abu Hamad KH, Abed Y, Abu Hamad B. Risk factors associated with preterm birth in the ghaza strip: hospital-based case-control study. *East Mediter Health J*. 2007;13:1132-1141.
25. Roberts WE, Morrison Jc, Hamer C, Wiser WL. The incidence of preterm labor and specific risk factors. *Obstet Gynecol*. 1990;76:855-895.
26. Mohammadian S, Vakili MA, Tabande A. Survey of related factors in prematurity birth. *Journal of Guilan University of Medical Sciences*. 2000;9:117-122. [Persian]

27. Rodrigues T, Barros H. Risk factors for preterm labor. *Acta Medica Portuguesa*. 1998;11:901-905.

Archive of SID

بررسی عوامل مؤثر در نارس بودن نوزادان متولد شده در بیمارستان شریعتی بندرعباس

دکتر رخشانه گودرزی^۱ دکتر سلما نادری^۱ دکتر سیدحسین سعادت^۱ دکتر شهرام زارع^۲ دکتر ساناز سلیمانی^۳ دکتر صدیقه توکلی^۳
^۱ استادیار گروه اطفال، واحد توسعه و تحقیقات بالینی بیمارستان کودکان^۲ دانشیار گروه پزشکی اجتماعی،^۳ پزشک عمومی، دانشگاه علوم پزشکی هرمزگان

مجله پزشکی هرمزگان سال هجدهم شماره چهارم مهر و آبان ۹۳ صفحات ۳۱۶-۳۰۹

چکیده

مقدمه: تولد زودرس از علل اصلی مرگ و ناتوانی در نوزادان و مسئله‌ای مهم در مراقبت‌های دوران بارداری می‌باشد. این

مطالعه به شرح عوامل خطر تولد زودرس در بیمارستان شریعتی بندرعباس پرداخته است.

روش کار: در این مطالعه مورد - شاهدهی که در مرکز آموزشی درمانی شریعتی بندرعباس در سال ۱۳۹۰ انجام شد، تعداد ۱۰۰ مادر با تولد نوزاد نارس به عنوان گروه مورد و ۲۰۰ مادر با تولد نوزاد رسیده به عنوان گروه شاهد مورد بررسی قرار گرفت. متغیرهای سن مادر، شغل مادر، تحصیلات والدین، سابقه قبلی تولد نوزاد نارس، ناهنجاری‌های آناتومیک رحم و دهانه رحم، بیماری‌های سیستمیک و عفونی مادر، مراقبت‌های دوران بارداری، تروما در بارداری، کم وزن‌گیری مادر، تعداد زایمان‌های قبلی مادر، فاصله دو بارداری، مصرف سیگار توسط مادر، اشکالات پرده‌های جنینی و مایع آمنیوتیک، سابقه سقط و حاملگی با روش‌های کمک باروری در دو گروه ارزیابی شد. اطلاعات جمع‌آوری شده در برنامه SPSS 16 وارد شده و آنالیز آماری با استفاده از *t-test* و *Chi-Square* انجام گرفت.

نتایج: نتایج نشان داد که در گروه مادران با تولد نوزاد نارس، پارگی زودرس کیسه آب ۹۲/۲۷ برابر، آنومالی‌های رحم و دهانه رحم حدود ۱۵ برابر، پره اکلامپسی ۵/۲۶ برابر، سابقه تولد نوزاد نارس ۴/۹۶ برابر، نسبت فامیلی والدین ۲/۱۷ برابر، عفونت ادراری ۲/۲۴ برابر و دیابت مادر ۲/۱۸ برابر بیشتر از گروه شاهد می‌باشد که تمامی این موارد با $P\text{-value} < 0.05$ معنی‌دار می‌باشند.

نتیجه‌گیری: با توجه به نتایج فوق، مهمترین عوامل خطر نارسایی پارگی زودرس کیسه آب، آنومالی‌های رحم و دهانه رحم، پره اکلامپسی و سابقه تولد نوزاد نارس می‌باشد.

کلیدواژه‌ها: زایمان - نوزاد نارس - نوزاد رسیده

نویسنده مسئول:

دکتر سلما نادری

بیمارستان کودکان دانشگاه علوم

پزشکی هرمزگان

بندرعباس - ایران

تلفن: +۹۸ ۹۱۷ ۳۶۱۳۱۵۴

پست الکترونیکی:

salmanaderi@gmail.com

دریافت مقاله: ۹۲/۲/۲۹ اصلاح نهایی: ۹۲/۵/۲۹ پذیرش مقاله: ۹۲/۶/۵