Risk Factors for Birth Before Arrival at Siriraj Hospital

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Abstract

Objective : To assess the potential risk factors for birth before arrival at Siriraj Hospital.

Study design : Prospective case-control study.

Setting : Department of Obstetrics & Gynecology, Faculty of Medicine Siriraj Hospital, Mahidol University.

Subjects : The subjects were 320 patients who had delivered at Siriraj Hospital and were divided into two groups. One hundred and sixty patients, who gave birth before admission to the labor room of Siriraj Hospital, were assigned as the study group. The control group consisted of 160 patients who had normal deliveries in the labor room of Siriraj Hospital at the same period of time.

Intervention : Information was obtained by interviewing the patients. Both the interviewer and the subjects were blinded to each other. The data were analyzed by using logistic regression model and EpiInfo program.

Main outcome measure : Information of antenatal care, socio-economic data, past obstetric history and present data of delivery.

Results : The six significant risk factors were identified; education level of the patients (odds ratio 6.11), past history of previous delivery (odds ratio 6.18), past history of preterm delivery (odds ratio 4.03), no antenatal care (odds ratio 8.55), unawareness of true labor symptoms (odds ratio 1.89) and present preterm delivery (odds ratio 2.99).

Conclusion : The risk factors identified from this study were low education level, past history of previous delivery, past history of preterm delivery, no antenatal care, unawareness of symptoms of true labor and present preterm delivery. The risk factors from this study should have further study to get more information that can apply to control birth before arrival.

Key word : Risk Factor, Birth Before Arrival

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J Med Assoc Thai 2002; 85: 1251-1257

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Nowadays, the call for return to the natural process has happened more frequently in many parts of the world, such as 30 per cent of pregnant women delivering at home in the Netherlands[1]. But in many places, great distance between women and health facilities restrict the options and make home birth the only choice. However, many studies have commented on the higher neonatal mortality for births that take place outside the hospital, not only the unplanned, but also planned home births[2-5].

Generally, it is not accepted to give birth at home in Thailand and it is still the fact that some pregnant women deliver while rushing to the hospital. Statistical report from the Obstetric and Gynecologic Registry Unit, Department of Obstetrics and Gynecology, Siriraj Hospital also showed that, there are still more than one hundred births before arrival each year at Siriraj Hospital[6].

The authors are concerned about this problem because of reports of a higher perinatal mortality rate for unplanned births outside the hospital, especially when the delivery was under the control of an inexperienced person[2,3].

However, this problem about birth before arrival should be solved systematically. So, the authors established a prospective case control study with a group of mothers who delivered before arrival at Siriraj Hospital, in order to establish the prevalence of birth before arrival in the local population and also identified the group of women at risk of giving birth before arrival. It is hoped that the result of this study can be used to improve the health policy and reduce the number of unexpected births outside hospitals in Thailand in the near future.

MATERIAL AND METHOD

The study was designed as a perspective case-control study. Three hundred and twenty pregnant women, who delivered at Siriraj Hospital, were enrolled in this study. The study group consisted of 160 patients who gave birth before admission at the labor room of Siriraj Hospital and comprised the control group.

Term birth before arrival was defined as a delivery, which took place at any site outside the labor room such as in the car, at home and even in the emergency room of the hospital. After the delivery, both mother and baby were taken to the labor room of Siriraj Hospital.

All information to complete the objective of this study was obtained by patient interview, especially information on antenatal care, onset of symptoms, socio-economic data, past and also present obstetric history. However, both interviewer and subjects were blinded to the objective of this study in order to reduce human bias and inappropriate questions.

Characteristics of all patients were described by mean, standard deviation (SD) and percentage. The data were analyzed by using the multiple logistic regression model and EpiInfo program. Statistical methods included the student's *t*-test, Fisher's exact test and Chi-square test. P-value < 0.05 was considered statistically significant.

RESULT

During the study period, 160 patients who gave birth before admission were enrolled as the study group, and also 160 patients who had normal deliveries in Siriraj labor room as the control group. During the same period of time, there were 25,728 births in Siriraj Hospital. The prevalence of birth before arrival in Siriraj Hospital can be expected to be 6.2 per 1000 births.

Table 1 shows the general characteristics of the study group and control group.

The socio-economic factors associated with birth before arrival are shown in Table 2, such as occupation, educational level, monthly income, etc. The factors, which can be determined as having no

Table 1. General characteristics.

Characteristics	Study group (N=160)	Control group (N=160)	P-value
Age (year)	25.1 ± 5.9	24.0 ± 5.7	0.096
Husband's age (year)	28.6 ± 7.0	26.9 ± 6.6	0.027
Years of education	5.5 ± 2.5	6.9 ± 2.6	< 0.001
Husband's years of education	7.0 ± 3.7	7.8 ± 3.2	0.03
Monthly income (Baht)	7,022.3 ± 3,710.5	7,457.5 ± 4,415.0	0.005

statistical difference, are age, marital status, marital age, religion, nationality, cigarette smoking and consuming alcohol.

The potential risk factors associated with the patient's husband are demonstrated in Table 3.

When confined to the obstetrical risk factors as shown in Table 4 and Table 5, multigravidarum, timing of labor during 00.00-06.00, antenatal clinic visiting, gestational age at delivery, birth weight, unawareness of labor symptoms, past history of previous delivery and past history of preterm labor, can be determined as the factors which have statistical difference between both groups.

Six risk factors which stand out from the others by using the multiple logistic regression method, include low educational level of the patient, past history of previous delivery, past history of preterm labor, no antenatal care, preterm labor at delivery and unawareness of labor symptoms.

DISCUSSION

Birth before arrival is one of the important health problems in Thailand, because of the high mortality of the infants and also high morbidity of the mothers[3,7,8]. In order to solve this problem, it is important to know the basic data, which have diffe-

Table 2. Socioeconomic factors associated with birth before arrival.

Risk factor	Study group (N=160)	%	Control group (N=160)	%	Odds ratio	95% CI*	P-value
Age (year)							
Equal or less than 25	87	54.4	91	56.9	0.90	0.57-1.44	0.65
More than 25	73	45.6	69	43.1			
Occupation							
None or temporary work	150	93.7	124	77.5	4.35	1.98-9.79	< 0.001
Regular work	10	6.3	36	22.5			
Educational level							
None	8	5	3	1.9	6.11	1.30-32.24	0.006
Primary school	127	79.4	101	63.1	2.88	1.61-5.17	< 0.001
Secondary school	24	15	55	34.4	1.00	0.48-2.08	1
University	1	0.6	1	0.6	2.29	0-88.27	0.55
Marital status							
Married with certificate	19	11.9	28	17.5	1.00	0.40-2.47	1
Married without certificate	131	81.9	122	76.3	1.58	0.80-3.12	0.15
Widow	0	0	1	0.6	-	-	-
Single	3	1.9	0	0	-	-	-
Divorce	7	4.3	9	5.6	1.15	0.31-4.16	0.80
Marital age							
Equal or less than 20	102	63.8	90	56.2	1.37	0.85-2.20	0.17
More than 20	58	36.2	70	43.8			
Monthly income (Baht)							
Equal or less than 7,000	107	66.8	86	53.8	1.74	1.08-2.80	0.02
More than 7,000	53	33.1	74	46.2			
Religion							
Buddhist	158	98.8	158	98.8	1	0.10-10.05	1
Christian	2	1.2	2	1.2			
Nationality							
Thai	159	99.4	159	99.4	1	0-36.89	1
Indian	1	0.6	1	0.6			
Cigarette smoking							
Smoker	13	8.1	6	3.7	2.27	0.78-6.90	0.1
Non-smoker	147	91.9	154	96.3			
Alcohol consuming							
Drinking	15	9.4	12	7.5	1.28	0.54-3.00	0.55
Non-drinking	145	90.6	148	92.5			
Drug using							
Current drug user	6	3.7	0	0	-	-	-
Non drug user	154	96.3	160	100			

* CI = confidence interval

Table 3. Socioeconomic factors associated with the patient's husband.

Risk factor	Study group (N=160)	%	Control group (N=160)	%	Odds ratio	95% CI*	P-value
Age (year)							
Equal or less than 25	56	35	61	38.1	0.93	0.74-1.18	0.56
More than 25	104	65	99	61.9			
Occupation							
None or temporary work	121	75.6	103	64.4	1.72	1.03-2.87	0.02
Regular work	39	24.4	57	35.6			
Educational level							
None	12	7.5	3	1.9	6.86	1.16-46.00	0.01
Primary school	87	54.4	83	51.9	1.80	0.62-5.34	0.23
Secondary school	54	33.8	62	38.7	1.49	0.50-4.56	0.43
University	7	4.3	12	7.5	1.00	0.22-4.56	1

* CI = confidence interval

Table 4. Current obstetrical risk factors.

	Study group (N=160)	%	Control group (N=160)	%	Odds ratio	95% CI*	P-value
Time leaving the house							
00.00-06.00	44	27.5	25	15.6	2.05	1.14-3.69	0.009
06.01-24.00	116	72.5	135	84.4			
Gravidity							
Multigravidarum	128	80.0	75	46.9	4.53	2.68-7.69	< 0.001
Primigravidarum	32	20.0	85	53.1			
Antenatal care unit visiting							
Yes	106	66.2	151	94.4	8.55	3.9-19.50	< 0.001
No	54	33.8	9	5.6			
Accompanying person to the hospital							
Yes	122	76.2	138	86.2	0.51	0.28-0.95	0.02
No	38	23.8	22	13.8			
Gestational age at delivery							
Preterm	44	27.5	18	11.2	2.99	1.58-5.71	< 0.001
Term	116	72.5	142	88.8			
Birth weight							
Equal or less than 2,500 g	34	21.2	14	8.8	2.81	1.38-5.79	0.001
More than 2,500 g	126	78.8	146	91.2			
Unawareness of labor symptoms							
Yes	97	60.6	119	74.4	1.89	1.14-3.12	0.008
No	63	39.4	51	25.6			

* CI = confidence interval

rent patterns depending on many factors. This study was established not only to improve the basic information for this problem but also as a model, which can be applied to other communities.

From the general characteristics in Table 1, the authors found that the level of the patient's education and their husband's, and monthly income were lower in the study group.

In this study, the risk factors of birth before arrival were divided into 3 groups, socio-economic factors of the patient and their husbands, present and past obstetrical factors as shown in Table 2 to 5. Fourteen risk factors can be demonstrated to have statistical significance (p-value < 0.05). By the multiple logistic regression method, 6 out of 14 risk factors have been shown to be more important. That includes low educational level of the patient, past history of previous delivery, past history of preterm labor, no antenatal care, preterm labor at delivery, unawareness of the true labor symptoms. The authors

Table 5. Past obstetrical risk factors.

	Study group (N=160)	%	Control group (N=160)	%	Odds ratio	95% CI*	P-value
History of previous delivery							
Yes	126	78.8	60	37.5	6.18	3.66-10.50	< 0.001
No	34	21.2	100	62.5			
History of preterm labor							
Yes	15	9.4	4	2.5	4.03	1.20-14.75	0.01
No	145	90.6	156	97.5			
History of birth before arrival							
Yes	7	4.3	2	1.2	3.61	0.68-25.59	0.09
No	153	95.7	158	98.8			
History of abortion							
Yes	16	10.0	28	17.5	0.52	0.26-1.06	0.052
No	144	90.0	132	82.5			

* CI = confidence interval

Table 6. Significant risk factors by the multiple logistic regression method.

Characteristics associated with birth before arrival	Odds ratio	95% CI*
Low educational level of the patient		
None	6.11	1.30-32.24
Primary school	2.88	1.61-5.17
Past history of previous delivery	6.18	3.66-10.50
Past history of preterm labor	4.03	1.20-14.75
No antenatal care	8.55	3.90-19.50
Preterm labor at delivery	2.99	1.58-5.71
Unawareness of labor symptoms	1.89	1.14-3.12

* CI = confidence interval

believe that these six factors are among the factors that play a significant role in unplanned birth outside the hospital.

Many studies have commented the risk factors predisposed to birth before arrival[7,8]. Beeram et al[7] reported in 1995 that poor antenatal care and poor health education during pregnancy played a role in the group of infants born unplanned out-of-hospital. Other predisposing factors included low socioeconomic status and poor nutrition of the mothers. Potter et al[8] investigated this problem in South Africa and found that the out-born infants had low birth weight and higher morbidity than in-born controls. The reasons identified were relative inaccessibility of health care facilities, distance from their homes to hospitals, and a lack of available ambulance services.

The prevalence of birth before arrival in Siriraj Hospital is approximately 0.62 per cent, which is different from other report such as Beeram[7] found 1.8 per cent of birth before arrival in Washington. However, the present study may represent some inner city problems in Bangkok, which has more than 7 million people[9].

Some of the predisposing factors for this problem can be easily corrected, such as; past history of previous delivery, which has predisposed to precipitate labor or easy delivery. Unawareness of true labor symptoms should also be corrected; by improving the educational support in antenatal care units.

The present findings are similar to some parts of the study from Harlem in New York City. The risk factors associated with their infants were uninsured, multigravid, illicit-drug-using women who had no or poor prenatal care[10]. Unfortunately, there was no drug use of the women in the control group, so the authors could not calculate the statistical difference between both groups for this variable.

Other risk factors, such as low educational level of the patient, past history of preterm labor, no antenatal care and preterm labor at this delivery, are

more complicated and difficult to deal with. However, they may be improved systematically in the future. Some are important and need a national policy to correct them such as educational support for Thai people. Some need better treatment guidelines and more study research to improve or solve the problems such as preterm. However, from Table 6, the odd ratio reflects the important order of the problem. The authors found the variable of poor antenatal care, had an outstanding odd ratio around 8.55. In this way, the order of the policy can be adjusted to correct the problem properly.

In conclusion, birth before arrival remains a problem in Siriraj Hospital at around 6.2 per 1,000 births and six potential risk factors have been mentioned. These findings can be used to solve this problem systematically. However, the results have to be rechecked in the future.

(Received for publication on February 9, 2002)

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ปัจจัยเสี่ยงของการคลอดบุตรก่อนถึงโรงพยาบาล ณ โรงพยาบาลศิริราช

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วัตถุประสงค์ : ศึกษาปัจจัยเสี่ยงต่อการคลอดบุตรก่อนถึงโรงพยาบาล ณ โรงพยาบาลศิริราช

รูปแบบการวิจัย : การวิจัยเชิงวิเคราะห์แบบมีกลุ่มเปรียบเทียบ

สถานที่ทำการวิจัย : ภาควิชาสูติศาสตร์-นรีเวชวิทยา คณะแพทยศาสตร์ศิริราชพยาบาล มหาวิทยาลัยมหิดล

กลุ่มตัวอย่าง : สตรีที่มาคลอดบุตร ณ โรงพยาบาลศิริราช จำนวน 320 ราย โดยแบ่งออกเป็น 2 กลุ่ม กลุ่มที่ 1 เป็นกลุ่มศึกษา คือสตรีที่คลอดบุตรก่อนถึงห้องคลอดของโรงพยาบาลศิริราชจำนวน 160 ราย ส่วนกลุ่มที่ 2 เป็นกลุ่มควบคุม คือสตรีที่คลอดบุตรปกติในห้องคลอดโรงพยาบาลศิริราชจำนวน 160 ราย และสตรีทั้ง 2 กลุ่มได้ถูกรับไว้เป็นผู้ป่วยในของโรงพยาบาลศิริราชในช่วงเวลาเดียวกัน

วิธีดำเนินการวิจัย : ทำการสัมภาษณ์สตรีที่มาคลอด ณ โรงพยาบาลศิริราช โดยผู้สัมภาษณ์ซึ่งไม่ทราบวัตถุประสงค์ของงานวิจัย จากนั้นรวบรวมข้อมูลที่ได้จากการสัมภาษณ์ในด้านต่าง ๆ มาทำการวิเคราะห์ด้วยวิธี Multiple logistic regression ร่วมกับการใช้โปรแกรม EpiInfo

ตัวชี้วัด : ข้อมูลเกี่ยวกับการฝากครรภ์, ข้อมูลลักษณะทางสังคมประชากร, ประวัติทางสูติกรรม และข้อมูลเกี่ยวกับครรภ์ปัจจุบันและการคลอดครั้งนี้

ผลการวิจัย : จากการศึกษาพบว่าปัจจัยเสี่ยงต่อการคลอดบุตรก่อนถึงโรงพยาบาลที่มีนัยสำคัญทางสถิติ ได้แก่การไม่ได้เรียนหนังสือ (odds ratio 6.11), การที่เคยคลอดบุตรมาก่อน (odds ratio 6.18), การที่เคยคลอดบุตรก่อนกำหนดในครรภ์ก่อน (odds ratio 4.03), การไม่ฝากครรภ์ (odds ratio 8.55), การไม่ระวังถึงอาการแสดงนำของการคลอด (odds ratio 1.89), การคลอดบุตรก่อนกำหนดในครรภ์นี้ (odds ratio 2.99)

สรุป : ปัจจัยเสี่ยงต่อการคลอดบุตรก่อนถึงโรงพยาบาลที่ได้จากการศึกษานี้ ได้แก่การมีระดับการศึกษาต่ำ, การที่เคยคลอดบุตรมาก่อน, การที่เคยคลอดบุตรก่อนกำหนดในครรภ์ก่อน, การไม่ฝากครรภ์, การไม่ระวังอาการแสดงนำก่อนการคลอด, การคลอดบุตรก่อนกำหนดในครรภ์นี้ ซึ่งผลจากการศึกษานี้อาจต้องมีการศึกษาเพิ่มเติม เพื่อนำไปประยุกต์ใช้ในการวางแผนควบคุมการคลอดบุตรก่อนถึงโรงพยาบาลได้ต่อไป

คำสำคัญ : ปัจจัยเสี่ยง, การคลอดบุตรก่อนถึงโรงพยาบาล

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