

Sexually Transmitted Infections and Pregnancy Outcomes in Women without Antenatal Care at Siriraj Hospital

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ABSTRACT

Objective: To demonstrate prevalence of sexually transmitted infections (STIs) and pregnancy outcomes in Thai pregnant women without antenatal care (ANC) who delivered at Siriraj Hospital.

Methods: Medical charts of pregnant women without ANC who delivered at Siriraj Hospital during 2010-2014 were reviewed. Data of all deliveries during the same time period were used for the comparison.

Results: During 2010-2014, out of 46,486 deliveries, 1,057 had no ANC, ranging from 197 to 229 / year. The average age was 25.5 ± 6.5 years and 85% were married. Prevalence of HIV infection, hepatitis B and other STIs in patients without ANC were 5.9% (62/1,057), 3.3% (35/1,057) and 1.4% (15/1,057), respectively. One third had consumed recreational drugs and urine amphetamine was positive in 20.8% of patients. The frequency of current smokers and current alcohol consumers were 14.6% (154/1,057) and 3.8% (40/1,057). Compared with all deliveries, those without ANC had significantly higher adverse pregnancy outcomes, including preterm birth (39.1% vs 14.0%, RR 2.29, 95%CI 2.10-2.49), birthweight < 2,500 gms (25.9% vs 12.6%, RR 1.84, 95%CI 1.65-2.05) and birthweight < 1,500 gms (4.1% vs 1.3%, RR 3.08, 95%CI 2.28-4.18). Teenage pregnancy significantly increased risk of preterm birth (aOR 1.86, 95%CI 1.36-2.55) and being separate doubled the risk of birthweight < 1,500 gms (aOR 2.13, 95%CI 1.02-4.46) after adjusting for history of recreational drug use, urine amphetamine, smoking, marital status, maternal age and concurrent STIs.

Conclusion: STIs and adverse pregnancy outcomes were highly prevalent among deliveries without ANC. Teenage pregnancy and lack of family support appears to increase the risk of poor pregnancy outcomes.

Keywords: No ANC; pregnancy outcomes; sexually transmitted infection; without ANC (Siriraj Med J 2017;69: 137-142)

INTRODUCTION

Antenatal care (ANC) is an essential part to promote mother-and-child health. The uptake rate in Thailand was as high as 98.9%.¹ Such process is considered a necessary step since screening of sexually transmitted infections (STIs), thalassemia, diabetes mellitus (DM), anemia, malnutrition and related health problems is performed, monitored and treated during this period. Nevertheless, a subset of pregnant patients had no ANC

and this might subsequently result in an increased risk of adverse pregnancy outcomes. Therefore, this study aimed to examine characteristics of pregnant women without ANC and determine the prevalence of STIs and adverse pregnancy outcomes.

MATERIALS AND METHODS

Siriraj Hospital is a tertiary care and teaching hospital where there are around 9,000 deliveries a year.

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All medical charts of pregnant women without ANC who delivered at Siriraj Hospital during 2010-2014 were reviewed. Exclusion criteria were women with multiple pregnancies, fetal abnormalities or non-viable pregnancy, and missing outcome data. Ethical approval was derived from the Siriraj Institutional Review Board, Mahidol University (COA. 419/2015).

On admission, all pregnant women with no ANC received thorough history-taking, physical examination, pelvic examination, trans-abdominal ultrasonography and immediate blood tests which included rapid test for human immunodeficiency virus (HIV) infection, venereal disease research laboratory (VDRL) for syphilis and hepatitis B surface antigen (HBsAg). Once HIV rapid test or VDRL test was positive, the confirmatory tests by fourth-generation HIV test or *Treponema pallidum* hemagglutination (TPHA) test was performed, respectively. Other sexually transmitted infections (STIs) such as condyloma accuminata, herpes genitalis, and molluscum contagiosum were diagnosed according to clinical criteria by the use of inspection and wet preparation technique. Moreover, all women were tested for urine amphetamine. Ultrasonography was performed in all cases to estimate gestational age (GA).

Pregnancy outcomes were preterm birth, low birthweight (LBW), very low birthweight (VLBW), birth asphyxia, birth before arrival (BBA), pregnancy-induced hypertension such as pre-eclampsia or eclampsia, clinical chorioamnionitis and contraception after delivery. Preterm birth was defined as delivery before completed 37-week gestation. LBW and VLBW were characterized by neonatal birthweight < 2,500 and < 1,500 gms, respectively. Birth asphyxia was defined as having Apgar score < 7 at 5 minutes after birth. Clinical chorioamnionitis was diagnosed by the presence of maternal fever (temperature > 37.8°C) accompanied by two or more of the following criteria: 1) maternal tachycardia (heart rate > 100 beats /min); 2) uterine tenderness; 3) foul-smelling odor of the amniotic fluid; 4) fetal tachycardia (heart rate > 160 beats/min); and 5) maternal leukocytosis (leukocyte count > 15,000 cells/mm³).² The definitions of pregnancy-induced hypertension were defined according to the International Society for the Study of Hypertension in Pregnancy.³

STATA version 12.0 (StataCorp LP, College Station, TX, USA) was used for the analysis. Descriptive statistics such as N (%) and mean \pm standard deviation (S.D.) were used. Chi square was used for the comparison of categorical variables among age groups (< 20, 20-29, \geq 30 years). Logistic regression was performed to explore the association between risk factors of preterm birth, LBW and VLBW and history of recreational drug use,

positive urine amphetamine, smoking, marital status, teenage pregnancy and concurrent STIs. $P < 0.05$ was considered statistically significant. Data of all deliveries during the same period of time were extracted for the comparison.⁴

RESULTS

During 2010-2014, out of 46,486 deliveries, there were 1,057 pregnant women without ANC (approximately 200 cases a year). Fig 1. The mean (\pm SD) maternal age was 25.5 ± 6.5 years and 54.0% of them had maternal age between 20-29 years old. One eighth was being separate. The level of education was less than or equal to primary school level in about 40% of patients. One third was housewives or unemployed. A quarter was primigravida and approximately 20% had previous history of miscarriages. One third reported previous use of recreational drugs, including metamphetamine 34.0% (359/1,057), cannabis 0.8% (8/1,057), ecstasy 0.3% (3/1,057) and ketamine 0.1% (1/1,057). One fifth was current users, 13.9% was current smokers and 3.6% was current alcohol consumers. (Table 1.)

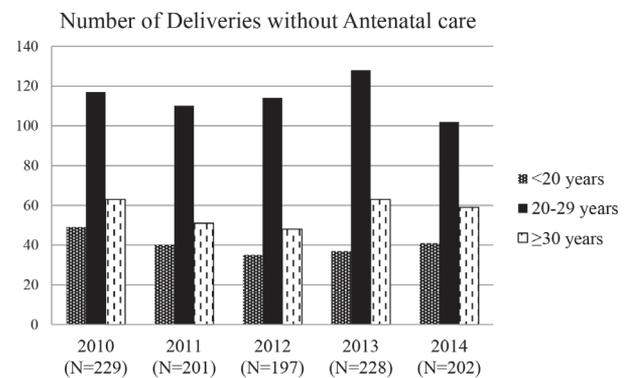


Fig 1. Number of pregnant women without antenatal care at Siriraj Hospital during 2010-2014 (N=1,057).

Table 2 shows HIV infection in 62/1,057 (5.9%), hepatitis B in 35/1,057 (3.3%), syphilis in 2/1,057 (0.2%) and other STIs in 15/1,057 (1.4%). Other STIs included genital warts (11), molluscum contagiosum (2), herpes genitalis (1) and trichomoniasis (1). The highest proportion of women with any STIs was in < 20-year group.

The average GA was 36.2 ± 2.9 weeks on the admission day. Time interval from admission to delivery ranged from birth before arrival (BBA) to 24 hours and this was not significantly different among the age groups. The average birthweight was $2,765 \pm 595$ gms. Adverse pregnancy outcomes were highly prevalent in this population. Of them, 39.1% (413/1,057) had preterm birth; 25.9% (274/1,057) had LBW and 4.1% (43/1,057)

TABLE 1. Characteristics of pregnant women without antenatal care who delivered at Siriraj Hospital during 2010-2014 (N=1,057).

Demographic data	Total (N=1,057)	Age < 20 (N=202)	Age 20-29 (N=571)	Age ≥ 30 (N=284)	p-value
Education					
Primary school and lower	448 (42.4)	87 (43.1)	241 (42.2)	120 (42.3)	0.948
Junior high school	393 (37.2)	78 (38.6)	211 (37.0)	104 (36.6)	
High school and higher	216 (20.4)	37 (18.3)	119 (20.8)	60 (21.1)	
Occupation					
Housewife/being unemployed	357 (33.8)	66 (32.7)	184 (32.2)	107 (37.7)	0.410
Business/office job	660 (62.4)	131 (64.8)	363 (63.6)	166 (58.4)	
Student	40 (3.8)	5 (2.5)	24 (4.2)	11 (3.9)	
Being separate	149 (14.1)	33 (16.3)	75 (13.1)	41 (14.4)	0.522
Obstetric history					
Primigravida	275 (26.0)	48 (23.8)	148 (25.9)	79 (27.8)	0.602
Previous miscarriage (s)	180 (17.0)	39 (19.3)	94 (16.5)	47 (16.6)	0.632
History of recreational drug use	371 (35.1)	65 (32.2)	194 (34.0)	112 (39.4)	0.181
Current smoker	147 (13.9)	28 (13.9)	79 (13.8)	40 (14.1)	0.995
Current alcohol consumer	38 (3.6)	8 (4.0)	20 (3.5)	10 (3.5)	0.953
Positive urine amphetamine	220 (20.8)	37 (18.3)	116 (20.3)	67 (23.6)	0.336

Data presented in N (%)

TABLE 2. Sexually transmitted infections in pregnant women without antenatal care who delivered at Siriraj Hospital during 2010-2014 (N=1,057).

Sexually transmitted infections	Total (N=1,057)	Age < 20 (N=202)	Age 20-29 (N=571)	Age ≥ 30 (N=284)	p-value
HIV infection	62 (5.9)	16 (7.9)	31 (5.4)	15 (5.3)	0.383
Hepatitis B	35 (3.3)	10 (5.0)	18 (3.2)	7 (2.5)	0.305
Syphilis	2 (0.2)	1 (0.5)	1 (0.2)	0 (0)	0.462
Other STIs	15 (1.4)	9 (4.5)	5 (0.9)	1 (0.4)	< 0.001

Data presented in N (%)

women delivered VLBW infants. The frequency of preterm birth was highest in age < 20-year group ($p < 0.001$), and they had the highest rate of not using any contraceptive method after delivery when compared to the other age groups ($p = 0.030$). (Table 3)

The prevalence of delivery without ANC at Siriraj Hospital was 2.3% (1,057/46,486). Compared with pregnant women with ANC, all adverse pregnancy outcomes were significantly higher in patients without ANC. (Table 4)

Univariate logistic regression analysis showed no association between common adverse pregnancy

outcomes, including preterm birth, LBW and VLBW, and history of recreational drug use, current drug use, current smoking, marital status and concurrent STIs. Teenage pregnancy increased the likelihood of having preterm birth at 78% (cOR 1.78(1.31-2.43), $p < 0.001$). Teenage pregnancy significantly increased risk of preterm birth (aOR 1.86, 95% CI 1.36-2.55 $p < 0.001$) and being separate doubled the risk of VLBW (aOR 2.13, 95%CI 1.02-4.46 $p 0.046$) after adjusting for history of recreational drug use, urine amphetamine, smoking, marital status, maternal age and concurrent STIs. (Table 5)

TABLE 3. Pregnancy outcomes in pregnant women without antenatal care who delivered at Siriraj Hospital during 2010-2014 (N = 1,057).

	Total (N=1,057)	Age < 20 (N=202)	Age 20-29 (N=571)	Age ≥ 30 (N=284)	p-value
Time interval to delivery					0.774
BBA	85 (8.0)	13 (6.4)	48 (8.4)	24 (8.4)	
< 30 minutes	180 (17.0)	33 (16.3)	96 (16.8)	51 (18.0)	
30-60 minutes	134 (12.7)	29 (14.4)	65 (11.4)	40 (14.1)	
61-120 minutes	215 (20.4)	36 (17.8)	125 (21.9)	54 (19.0)	
120+ minutes	443 (41.9)	91 (45.1)	237 (41.5)	115 (40.5)	
Preterm birth	413 (39.1)	101 (50.5)	211 (37.0)	101 (35.2)	0.001
VLBW	43 (4.1)	8 (4.0)	28 (4.9)	7 (2.4)	0.224
LBW	274 (25.9)	47 (23.5)	153 (26.8)	74 (25.8)	0.649
Birth asphyxia	32 (3.0)	4 (2.0)	20 (3.5)	8 (2.8)	0.542
Pre-eclampsia	26 (2.5)	4 (2.0)	16 (2.8)	6 (2.1)	0.731
PPH	22 (2.1)	5 (2.5)	11 (1.9)	6 (2.1)	0.889
Chorioamnionitis	4 (0.4)	0 (0)	3 (0.5)	1 (0.4)	0.578
No contraception after delivery	187 (17.7)	43 (21.5)	107 (18.8)	37 (12.9)	0.030

Data presented in N (%)

BBA=birth before arrival, birth asphyxia = Apgar at 5min < 7, VLBW=very low birthweight, LBW=low birthweight, PPH=post-partum hemorrhage

TABLE 4. Comparison of demographic data, sexually transmitted infections and pregnancy outcomes between patients without antenatal care and all deliveries at Siriraj Hospital during 2010-2014.

	No ANC (N=1,057)	All deliveries (N =46,486)	RR (95%CI)
Preterm birth	413 (39.1)	6,514 (14.0)	2.29 (2.10-2.49)*
History of recreational drug	371 (35.1)	599 (1.3)	20.42 (18.14-22.99)*
LBW	274 (25.9)	5,842 (12.6)	1.84 (1.65-2.05)*
Teenage pregnancy	202 (19.1)	3,708 (7.8)	2.17 (1.91-2.47)*
Current smoker	147 (13.9)	91 (0.2)	62.49 (48.42-80.65)*
Birth before arrival	85 (8.0)	31 (0.1)	111.69 (74.34-167.79)*
HIV infection	62 (5.9)	332 (0.7)	7.81 (6.00-10.18)*
VLBW	43 (4.1)	597 (1.3)	3.08 (2.28-4.18)*
Current alcohol consumer	38 (3.6)	44 (0.1)	36.70 (23.88-56.41)*
Pre-eclampsia	26 (2.5)	26 (0.1)	42.95 (25.02-73.72)*

Data presented in N (%)

ANC= antenatal care, HIV = human immunodeficiency virus, LBW = low birthweight or < 2,500 gm, RR= risk ratio, STIs=sexually transmitted infections, VLBW = very low birthweight or < 1,500 gm

*p < 0.001

TABLE 5. Logistic regression analysis of the predictive factors of adverse pregnancy outcomes.

	N (%)	cOR	p-value	aOR*	p-value
Preterm birth	Total (N=413)				
History of recreational drug use	152 (36.8)	1.13(0.87-1.46)	0.353	0.82(0.56-1.20)	0.311
Positive urine amphetamine	97 (23.5)	1.30(0.96-1.76)	0.087	1.44(0.93-2.23)	0.102
Current smoker	70 (17.0)	1.42(1.00-2.00)	0.048	1.35(0.91-2.01)	0.138
Being separate	66 (16.0)	1.29(0.91-1.82)	0.159	1.21(0.85-1.73)	0.290
Teenage	101 (24.5)	1.78(1.31-2.43)	< 0.001	1.86(1.36-2.55)	< 0.001
Having any STIs	41 (9.9)	1.17(0.76-1.80)	0.393	1.24(0.80-1.92)	0.328
BW< 2,500 g	Total (N=274)				
History of recreational drug use	95 (34.7)	0.97(0.73-1.30)	0.863	0.82(0.53-1.26)	0.366
Positive urine amphetamine	60 (21.9)	1.09(0.78-1.53)	0.608	1.20(0.73-1.96)	0.470
Current smoker	41 (15.0)	1.08(0.73-1.59)	0.710	1.08(0.69-1.68)	0.745
Being separate	47 (17.2)	1.38(0.95-2.01)	0.092	1.41(0.96-2.07)	0.076
Teenage	47 (17.2)	0.85(0.59-1.22)	0.386	0.87(0.60-1.25)	0.449
Having any STIs	33 (12.0)	1.54(0.98-2.41)	0.061	1.51(0.96-2.38)	0.073
BW< 1,500 g	Total (N=43)				
History of recreational drug use	11 (25.6)	0.62(0.31-1.25)	0.186	0.78(0.29-2.08)	0.611
Positive urine amphetamine	6 (14.0)	0.61(0.25-1.46)	0.263	0.95(0.28-3.22)	0.940
Current smoker	2 (4.7)	0.28(0.07-1.18)	0.084	0.31(0.07-1.41)	0.130
Being separate	10 (23.3)	1.91(0.92-3.96)	0.083	2.13(1.02-4.46)	0.046
Teenage	8 (18.6)	0.98(0.45-2.14)	0.957	0.96(0.43-2.12)	0.915
Having any STIs	6 (14.0)	1.70(0.70-4.15)	0.239	1.76(0.71-4.33)	0.221

*Adjusting for history of recreational drug use, positive urine amphetamine, current smoker, being separate, teenage, having any STIs

DISCUSSION

One in fifty deliveries at Siriraj Hospital had not performed blood tests, received appropriate vaccination and nutrition as well as prenatal care education. Deliveries without ANC significantly increased adverse pregnancy outcomes, including preterm birth, LBW and VLBW. There was a high prevalence of STIs and recreational drug use in this population. Teenage pregnancy increases the risk of preterm labor and lack of support from partners doubles the risk of VLBW.

Currently, the policy of participating in ANC in our country is free of charge and easy to access. Yet, patients who are considered to have enough maturity such as age ≥ 20 years are the main population in 'no ANC' problem. The use of recreational drug might affect the level of maternal responsibility. Previous study by Atigitrungruang R, demonstrated that women with no ANC are associated with prior or current use of recreational drug and existing smoker as well as alcohol consumption compared to those with ANC.⁵

Poor family support subsequently leads to suboptimal motherhood insight which will potentially result in poor pregnancy outcomes such as VLBW. Therefore, antenatal care policy is a long term development process, which involves not only pregnant women, but also their families. Providing sexual health education and counseling for patient as well as their family might resolve the problems.

According to the systematic review by Salam RA *et al*, to increase sexual knowledge and contraceptive use, clinic-based education is most appropriate amongst the different sources, including peers, parents, school or technology.⁶ This may imply that all hospital/ clinic visits can help to increase the social awareness of the importance of ANC. Another review by Mbuangbaw L *et al* recommended a combination of the interventions, including media campaigns, financial incentives and home visits, improved ANC coverage which would result in lower perinatal morbidity and mortality.⁷

Teenage pregnancy is currently a problem of great interest in Thailand because of their mental and

physical immaturity. Prevalence of maternal anemia⁸ and Caesarean section⁹ appeared higher in this population. In addition, they were less likely to attend ANC clinic.⁸ As a result, compatible with a previous study in Thailand⁸, LBW was more common in this group than in older mother group.

The reported prevalence of teenage pregnancy was 4.2-50.0%.¹⁰ Our finding about the prevalence of teenage pregnancy (7.8%) was consistent with a large-scale study in the United State, at 9.4%.¹¹ Compatible with the systematic review by de Azevedo WF et al, teenage pregnancy increased the risk of preterm birth and LBW.¹⁰ The present study has emphasized the high impact of premature maternity among pregnant women without ANC, in which after taking all factors into consideration, teenage pregnancy *per se* almost doubled the incidence of preterm birth.

Vertical transmission of HIV infection should have been fully eliminated if the 'no ANC' problem had been solved. In 2015, Thailand received the validation from World Health Organization for eliminating mother-to-child transmission of HIV as the prevalence of HIV-infected pregnant women and newborns in Thailand were 0.6% and 1.9%, respectively.¹² The keys to success include early detection of HIV cases, initiation of highly active antiretroviral therapy (HAART) as soon as possible and developing safe sex education during pregnancy to avoid contacting STIs.¹³ Without ANC, new infection of HIV during pregnancy which poses the highest risk of mother-to-child transmission cannot be detected.¹⁴ Among women without ANC, the prevalence of HIV-infected pregnant women was as high as 5.9%. Medical personnel should take this opportunity to provide intensive education/counseling on self-care and contraception to them in order to minimize onward transmission and repetition of unplanned pregnancy.

The strengths of this study are: 1) it is one of very few studies on this issue and contains a large sample size; and 2) medical records were quite complete due to the department's settled clinical practice guideline. However, some important aspects were not addressed, especially the actual reasons underlying the causes of absence from ANC clinic and long-term neonatal outcomes. Another limitation was GA being estimated by a single trans-abdominal ultrasonography on the admission day of which the accuracy was +/- 3 weeks.

In conclusion, STIs, preterm birth, LBW and VLBW were highly prevalent among deliveries without ANC. Teenage pregnancy and poor family support increase risk of the adverse pregnancy outcomes.

REFERENCES

1. Kongsri S, Limwattananon S, Sirilak S, Prakongsai P, Tangcharoensathien V. Equity of access to and utilization of reproductive health services in Thailand: national Reproductive Health Survey data, 2006 and 2009. *Reprod Health Matters* 2011;19(37):86-97.
2. Gibbs RS, Blanco JD, St Clair PJ, Castaneda YS. Quantitative bacteriology of amniotic fluid from women with clinical intraamniotic infection at term. *J Infect Dis* 1982;145(1):1-8.
3. Brown MA, Lindheimer MD, de Swiet M, Van Assche A, Moutquin JM. The classification and diagnosis of the hypertensive disorders of pregnancy: statement from the International Society for the Study of Hypertension in Pregnancy (ISSHP). *Hypertens Pregnancy* 2001;20(1):IX-XIV.
4. Titapant V, Chayawattana S, Sarnsuwan S, Wonglamai M, Leelavijarn A, Wuttiviboonchok W, et al. Annual statistical report 2010-2014. Division of Obstetrics & Gynaecology Registry, Department of Obstetrics & Gynaecology, Faculty of Medicine Siriraj Hospital, Mahidol University.
5. Atigitrungruang R. Methamphetamine abuse during pregnancy: Psychosocial outcome in teen mothers and associated factors towards neonatal growth. [Accessed 10 January 2017] <http://www.ped.si.mahidol.ac.th/thesis/image/RAWIPORN%20ATIGITRUNGRUANG-20131018110852.pdf>
6. Salam RA, Faqqah A, Sajjad N, Lassi ZS, Das JK, Kaufman M, Bhutta ZA. Improving Adolescent Sexual and Reproductive Health: A Systematic Review of Potential Interventions. *J Adolesc Health* 2016;59(4S):S11-S28.
7. Mbuagbaw L, Medley N, Darzi AJ, Richardson M, Habiba Garga K, Ongolo-Zogo P. Health system and community level interventions for improving antenatal care coverage and health outcomes. *Cochrane Database Syst Rev* 2015;(12):CD010994.
8. Kositworakitkun L, Watcharotn W, Junlapakee C. Comparison of Maternal and Neonatal Outcomes of Teenage versus Adult Pregnancies at Buddhachinaraj Hospital. *Thai J Obstetrics and Gynaecology* 2016;24: pp.
9. Kovavisarach E, Chairaj S, Tosang K, Asavapiriyant S, Chotigeat U. Outcome of teenage pregnancy in Rajavithi Hospital. *J Med Assoc Thai* 2010;93(1):1-8.
10. Azevedo WF, Diniz MB, Fonseca ES, Azevedo LM, Evangelista CB. Complications in adolescent pregnancy: systematic review of the literature. *Einstein (Sao Paulo)* 2015; 13(4):618-26.
11. Lopoo LM. Labor and delivery complications among teenage mothers. *Biodemography Soc Biol* 2011;57(2):200-20.
12. Lolekha R, Boonsuk S, Pliat T, Martin M, Tonputsa C, Punsuwan N, et al. Elimination of Mother-to-Child Transmission of HIV - Thailand. *MMWR Morb Mortal Wkly Rep* 2016;65(22):562-6.
13. Thisyakorn U. Elimination of mother-to-child transmission of HIV: lessons learned from success in Thailand. *Paediatr Int Child Health* 2017;37(2):99-108.
14. Goulder PJ, Lewin SR, Leitman EM. Paediatric HIV infection: the potential for cure. *Nat Rev Immunol* 2016;16(4):259-71.