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The Prevalence of Vertical Transmission of HIV Infection in Maharat Nakorn Ratchasima Hospital

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ABSTRACT

Objective: To determine the prevalence of vertical transmission of HIV infection in Maharat Nakorn Ratchasima Hospital.

Design: Retrospective, descriptive study.

Materials and Methods: This retrospective, descriptive study had recruited 205 pregnant women with HIV infection and delivery in Maharat Nakorn Ratchasima Hospital between October 1, 2005 and September 30, 2008. Thirty nine of them were excluded because of no antenatal care and no antiretroviral therapy. The diagnosis of vertical transmission was identified by positive of PCR for HIV-DNA in children. Twenty six patients were then excluded due to loss follow up and 4 of them have stillbirths or neonatal death. They did not have a laboratory examination. There were 136 children who came for follow-up. Data were extracted from medical records and reviewed.

Results: The overall vertical transmission rate was 4.41% (6/136). According to mode of delivery, 3.96% (4 cases) was normal delivery, 14.29% (1 case) was delivered by vacuum extraction and 5.26% (1 case) by emergency cesarean delivery. However, gestational age and premature rupture of membranes had not effected on vertical transmission.

Conclusion: The prevalence of vertical transmission of HIV infection in Maharat Nakorn Ratchasima Hospital was 4.41%. Elective cesarean delivery did not prevent maternal-to-fetal transmission

Keywords: vertical transmission, maternal-to-fetal transmission, HIV infection, elective cesarean delivery

Introduction

The vertical transmission of human immunodeficiency virus (HIV) infection is approximately 19 - 36 % without antiretroviral therapy. The transmission was occurred during 3 stages: antepartum, peripartum and postpartum period. The highest incidence of the vertical transmission was in peripartum period. The factors associated with the transmission were antiretroviral therapy in mother and child, routes of delivery and breastfeeding[1-8].

From World Health Organization (WHO) recommendation, antiretroviral therapy and no breast-feeding can reduce the transmission rate to 2%[1].

There is no definite recommendation on routes of delivery to reduce transmission rate[1,2,4,5,9,10].

Previous studies show that antiretroviral therapy and exemption of breastfeeding were able to reduce the vertical transmission rate[1-8]. However, role of elective cesarean delivery for reduction of vertical transmission rate is controversial[1,2,4,5,9,10].

This study was aimed to determine the prevalence of vertical transmission of HIV infection and examined whether elective cesarean delivery can reduce the vertical transmission in women whom received antiretroviral therapy during antenata and peripartum period at Maharat Nakorn Ratchasima Hospital. These findings lead to protocol for improving maternal and neonatal outcomes.

Materials and Methods

This retrospective, descriptive study reviewed data from Maharat Nakorn Ratchasima Hospital during 1st October 2005 until 30th September 2008. The Institution Ethics Committee approved this study. Data were collected from medical records. A total of 205 cases of pregnant women with HIV infection were identified and 39 of them were excluded because of no antenatal care and no antiretroviral therapy.

This study included 166 pregnant women who received antiretroviral therapy for HIV infection. The diagnosis of vertical transmission was identified by positive of Polymerase Chain Reaction (PCR) for HIV DNA in children. Thirty women were excluded from study because of no PCR for HIV DNA and 26 women were loss follow up. Three cases were stillbirths and 1 case was neonatal death.

Medical records were examined carefully for variables. These included maternal age, gravidity, gestational age (corrected from both last menstrual period and ultrasonography), the time of delivery from premature rupture of membranes.

Differences in the frequencies of events between both groups (positive and negative of PCR for HIV DNA) were analyzed by Pearson chi-square test. p-value < 0.05 was statistically significant.

Results

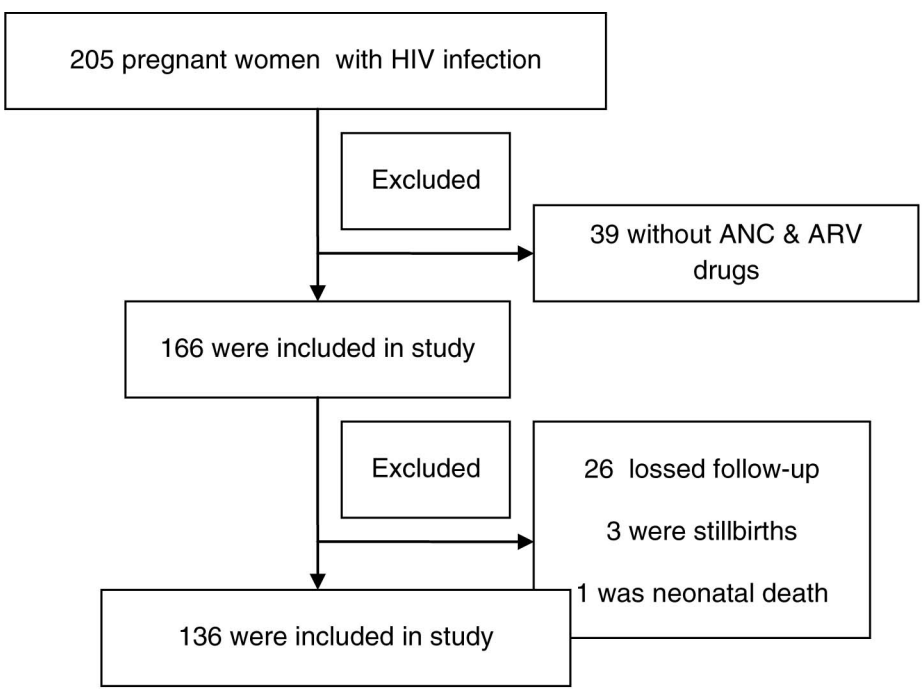

Fig. 1. Population in study

Table 1. The vertical transmission rate with demographic data

Parameters	No.(%) of children[a]		Total
	Anti-HIV Positive N = 6	Anti-HIV Negative N = 130	
Maternal age(years)			
15 – 19	1 (8.33)	11 (91.67)	12
20 – 34	5 (4.67)	102 (95.33)	107
≥ 35	0	17 (100)	17
Grava			
G < 5	6 (4.51)	127 (95.49)	133
G ≥ 5	0	3 (100)	3
Total	6 (4.41)	130 (95.59)	136

[a] infants born to mothers pregnant twin represent to one child

The maternal age was divided into 3 groups: 15 - 19 years is adolescent, 20 - 34 years is normal reproductive age, ≥ 35 years is elderly group. Mean of maternal age was 27.33 years old. Elderly maternal age group had no vertical transmission of infection, but without clinically significant.

Gravida in pregnant women with HIV infection was divided in 2 groups: G < 5 and G ≥ 5 (Grand multiparity). From this study, the grand multiparity group had no vertical transmission of infection, but without clinical significance.

During the study period, there were 6 cases of positive Anti-HIV from 136 pregnant women with HIV infection who received antiretroviral therapy and delivered at Maharat Nakorn Ratchasima Hospital. The prevalence of vertical transmission was 4.41%.

Table 2. The vertical transmission rate, comparing the time of labor, PROM and modes of delivery

Parameters	No.(%) of children[a]		Total	p-value
	Anti-HIV Positive N = 6	Anti-HIV Negative N = 130		
Labor				
Preterm delivery	0	22 (100)	22	0.312
Term delivery	6 (5.26)	108 (94.74)	114	
PROM				
< 4 hours	5 (4.5)	106 (95.5)	111	0.937
≥ 4 hours	1 (4)	24 (96)	25	
Modes of delivery				
Normal labor	4 (3.96)	97 (96.04)	101	0.427
Breech assisting	0	0	0	
Vacuum extraction	1 (14.29)	6 (85.71)	7	
Elective C/S	0	9 (100)	9	
Emergency C/S	1 (5.26)	18 (94.74)	19	
Total	6 (4.41)	130 (95.59)	136	

[a] infants born to mothers pregnant twin represent to one child

All cases who had vertical transmission were in the term delivery group (5.26% of term neonates). There was no vertical transm ission in preterm delivery group.

In the group of premature rupture of membranes (PROM) before delivery, the transmission rate was 4.5% and 4% in PROM < 4 hours and ≥ 4 hours, respectively.

There weree : 3.96 % transmission rate in normal delivery, 14.29% transmission rate in vacuum extraction, 5.26% transmission rate in emergency cesarean delivery and zero in elective cesarean delivery.

Thirty cases were excluded because of no laboratory examination.

Discussion

The vertical transmission of HIV infection in newborns whose mothers received antiretroviral therapy during antenatal care and peripartum period in Maharat Nakorn Ratchasima Hospital was 4.41%. The prevalence from the previous studies during 2004 and 2007 was about 1.1 – 2.8 %[1,4,6]. One previous study was from Thailand[6]. The vertical transmission rate in Maharat Nakorn Ratchasima Hospital was higher than the international study. This may be because this study was performed in the tertiary referral centers. The vertical transmission rate of HIV infection did not difference in elderly gravidarum or grand multiparity, similar to previous studies.

The previous studies were claimed that if the time of delivery occurred within 4 hours after PROM could reduce the vertical transmission rate[1,2,4,5,9,10]. In this study, the transmission rate was similar between PROM < 4 hours and ≥ 4 hours. Approximately eighty percents (5/6) of positive vertical transmission cases were delivered within 4 hours after PROM.

There was no infection in elective cesarean delivery before labor pain. Higher vertical transmission rate was found in peripartum period[1]. If the uterine was contracted, the maternal-fetal circulation was higher. This could increase viral load from mother-to-child[1]. According to the previous studies, role of elective cesarean delivery is controversial[1,2,4,5,9,10].

The limitation of this study is retrospective and some data may be wrongincluding 15% of data have been loss. Some data such as antiretroviral therapies, history of previous vertical transmission were unable to collect. In the future, prospective study should be done in order to control variables.

In conclusion, the vertical transmission rate of HIV infection in newborns whose mothers received antiretroviral therapy during antenatal care and peripartum period was 4.41%.

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อุบัติการณ์การติดเชื้อเอชไอวีจากมารดาสู่ทารกในสตรีตั้งครรภ์ที่ติดเชื้อเอชไอวี และคลอดในโรงพยาบาลมหาราชนครราชสีมา

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วัตถุประสงค์ *: เพื่อศึกษาอุบัติการณ์การติดเชื้อเอชไอวีจากมารดาสู่ทารกในสตรีตั้งครรภ์ที่ติดเชื้อเอชไอวี และคลอดในโรงพยาบาลมหาราชนครราชสีมา*

วัสดุและวิธีการ *: ทบทวนเวชระเบียนของสตรีตั้งครรภ์ที่ติดเชื้อเอชไอวี 205 ราย ที่มาคลอดบุตรที่โรงพยาบาลมหาราชนครราชสีมา ในช่วงเวลาตั้งแต่ 1 ตุลาคม 2548 ถึง 30 กันยายน และคัดออกจากการศึกษา 39 คน เนื่องจากไม่ได้ฝากครรภ์และไม่ได้รับยาต้านไวรัส การวินิจฉัยจะใช้การเจาะเลือดตรวจหาการติดเชื้อในทารกหลังคลอด จึงมีการคัดออกจากการศึกษาอีก 26 คน เนื่องจากไม่มาเจาะเลือด และ 4 คน ทารกตายก่อนได้รับการตรวจเลือด จึงเหลือทารกที่ได้รับการตรวจเลือดทั้งหมด 136 ราย การตรวจวินิจฉัยการติดเชื้อในทารกใช้วิธี PCR สำหรับ HIV-DNA*

ผลการศึกษา *: อุบัติการณ์การติดเชื้อจากมารดาสู่ทารกในสตรีตั้งครรภ์ที่ติดเชื้อเอชไอวีเท่ากับ 4.41% พบว่าทารกที่ติดเชื้อทั้งหมด 6 คนนั้นคลอดครรภ์ครบกำหนด มารดาเหล่านี้คลอดปกติ ร้อยละ 3.96 (4 ราย) คลอดโดยผ่าท้องทำคลอด ร้อยละ 14.29 (1 ราย) และคลอดโดยเครื่องดูดสุญญากาศ ร้อยละ 5.26 (1 ราย) สำหรับอายุครรภ์ การแตกของถุงน้ำคร่ำก่อนการเจ็บครรภ์คลอดไม่พบความสัมพันธ์กับการติดเชื้อ*

สรุป *: อุบัติการณ์การติดเชื้อเอชไอวีจากมารดาสู่ทารกในโรงพยาบาลมหาราชนครราชสีมาเท่ากับ 4.41% การผ่าตัดคลอดก่อนการเจ็บครรภ์หรือถุงน้ำคร่ำแตกสามารถลดอุบัติการณ์การติดเชื้อเอชไอวีจากมารดาสู่ทารกได้ แต่ไม่มีนัยสำคัญทางสถิติ อาจต้องทำการศึกษาต่อไปโดยอาจเพิ่มจำนวนประชากรกลุ่มตัวอย่าง*