Prevalence of Low Birthweight Infants in HIV-Infected Women Delivered in Rajavithi Hospital

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Objective: *To determine the prevalence of low birthweight infants in HIV-infected pregnant women delivered in Rajavithi Hospital and the relationship between antiretroviral drugs and low birthweight infants.*
Material and Method: *All numbers of low birthweight (LBW) infants and pregnant women with or without HIV infection delivered in Rajavithi Hospital during 2004-2008 from medical records were used. Two hundred HIV-infected pregnant women who delivered their infants at the same period were random for description and analysis.*
Results: *The prevalence of low birthweight infants delivered by HIV and non HIV-infected pregnant women were 12.6% (53/420) and 13.3% (4,249/31,975), respectively. There was no significant association between HIV infection and low birthweight (p = 0.688). Low birthweight infants delivered from HIV-infected pregnant women with and without antiretroviral therapy were 9.9% (7/41) and 13.6% (19/159), respectively. Various types of antiretroviral (ARV) drug including no ARV were significantly associated with LBW (p = 0.021). The one who received highly active antiretroviral therapy (HAART) had 2.27 times higher risk in having LBW.*
Conclusion: *The prevalence of low birthweight infants among HIV-infected pregnant women was 12.6%. There was no association between HIV infection and LBW. HAART might be a risk of LBW.*

Keywords: *Low birthweight, HIV-infected pregnant women, Antiretroviral therapy, HAART, Rajavithi Hospital*

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Human immunodeficiency virus (HIV) infection is an important problem of public health in Thailand. Since the first HIV case in gay then epidemics spread to commercial sex workers (CSW), men had sex with CSW and then to their families which can vertically transmit to their children. HIV infection might cause various adverse pregnancy outcomes such as spontaneous abortion, fetal death, growth restriction, preterm birth, preterm delivery, low birthweight infants, stillbirth, perinatal and infant mortality[1].

Currently many developed and developing countries use several kinds of antiretroviral (ARV) drugs for treatment or prevention of mother-to-child HIV transmission (MTCT). Some study found adverse pregnancy outcomes in these patients especially low birthweight (LBW) infants though their related evidence was not clear[1].

For this study the authors were interested in the prevalence of low birthweight infants in HIV-infected women and to evaluate the relationship between ARV drug and LBW in Rajavithi Hospital. Determination of the magnitude of LBW in these patients will be the information for improving management in these patients and for further studies.

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Material and Method

The present study was retrospective descriptive study approved by Rajavithi Hospital Ethics Committee.

All numbers of low birthweight infants (birthweight < 2,500 grams)[2] and pregnant women with or without HIV infection delivered in Rajavithi Hospital during 1st January 2004-31st December 2008 were collected and analyzed for prevalence. Then the medical records of 200 HIV-infected pregnant women who delivered at the same period were randomly selected and reviewed. This number derived from sample size calculation using one single proportion ($n = Z^2_{\alpha/2} \times p \times$

(1-p)/ d^2 giving p = 0.12[3], α = 0.05sample size = 1.96 x 1.96 x 0.12 x 0.88/0.05 x 0.05 = 162.27) and 20% added equaled 194.72 cases.

The medical data were extracted for maternal age, numbers of ANC, body mass index (BMI), anemia, gestational age, complication of pregnancy, antiretroviral therapy and infants' birthweight. All the data were recorded and analyzed by SPSS version 17.0 Statistics such as number and percentage were used for descriptive data. Odds ratio (OR) with 95% confidence interval (CI) and Chi-square were used for comparison with significance at p-value < 0.05.

Results

During 1st January 2004 and 31st December 2008, there were 31,983 deliveries and 416 HIV infected parturients (1.3%). Four hundred and twenty babies (4 pairs of twins) were born from these HIV-infected mothers. The prevalence of LBW in HIV-infected and non HIV-infected pregnant women were 12.6% (53/420) and 13.3% (4,249/31,975), respectively. There was no significant association between HIV infection and LBW (p = 0.688) (Table 1).

Eighty one point five percent of HIV-infected pregnant women were between 20-34 years. Teenage pregnancy was 12%. Most of them (60%) had low BMI (< 18.5 Kg/m^2). Poor ANC less than 4 times was 35%. Most of them had no anemia, only 13.5% had hematocrit < 33%. Preterm birth was 13% and pregnancy induced hypertension was 3%. The mean and standard deviation (SD) of low birthweight among HIV infection was 2,069.88 $\pm$ 374.11 grams.

There were distribution of LBW among various type of ARV and non ARV drug with significance, p-value = 0.021 (Chi-square = 9.73, df = 3). In contrast, there was no significant association between each type of ARV drug with LBW. HIV-infected pregnant women who received HAART had LBW 2.27 times higher than those without ARV (Table 2).

Discussion

The prevalence of low birthweight infants in

Table 1. Prevalence of LBW in HIV-infected and non HIV-infected pregnant women in Rajavithi Hospital during 2004-2008

Pregnant women	Delivery	Infants		
		Non-low birthweight	Low birthweight*	Total
			n (%)	
HIV-infected*	416	367	53 (12.6)	420
Non HIV-infected	31,567	27,726	4,249 (13.3)	31,975
Total	31,983	28,093	4,302 (13.3)	32,395

*p = 0.688, Odds ratio (OR) with 95% confidence interval = 0.94 (0.71-1.26), HIV = Human immunodeficiency virus, LBW = Low birthweight

Table 2. Comparison between ARV drug and LBW (200 cases)

HIV-infected pregnant women	Low birthweight n (%)	Normal birth weight n (%)	OR (95% CI)
Without Antiretroviral therapy	7 (26.9)	34 (19.5)	1
Monotherapy	2 (7.7)	17 (9.8)	0.57 (0.11-3.05)
Dual therapy	10 (38.5)	108 (62.1)	0.45 (0.16-1.27)
HAART therapy	7 (26.9)	15 (8.6)	2.27 (0.68-7.61)
Total	26	174	

p-value = 0.021 (Chi-square = 9.73, df = 3), HAART = Highly active antiretroviral therapy

HIV-infected and non HIV-infected pregnant women in Rajavithi Hospital during January 2004-December 2008 were 12.6% and 13.3%, respectively. HIV infection had no association with LBW in the present study. This finding was similar to the studies of Alger LS, Dabis F, Holt E, Lepage P and Tuomala RE et al [4-8] but was different to many studies that reported this association[3,9-21].

In this present study, about 80% of the HIV-infected pregnant women received ARV drugs either for treatment or prevention of MTCT. There was significant relationship between ARV drug and LBW, but no significant relationship was found when comparing each type of ARV to no ARV treatment. The present study demonstrated that mono therapy and dual therapy were preventive factors but triple therapy was a factor with 2 times riskier. During the period of the study no HAART was given for prevention of MTCT so the women received HAART should have low immune and poor health which could affect the newborn's birthweight. The result of this study is similar to that of Ekouevi DK, et al[21], they found that HAART before and during pregnancy was related to LBW.

Although the prevalence of low birthweight infants in HIV-infected pregnant women was not significantly different to that of non HIV-infected pregnant women in this study, the association between low birthweight infants and antiretroviral therapy was found. However, this study could not exactly conclude that antiretroviral therapy was the risk of low birthweight infants because of the small sample size calculated for prevalence. The authors suggest prospective comparative study instead of retrospective descriptive study to collect more suitable sample sizes and record all important factors affecting adverse pregnancy outcomes. In addition, multivariate logistic regression analysis is necessary for reducing confounding factors and for analyzing more accurate and significant factors. The association between antiretroviral therapy and increased risk of low birthweight infants still requires confirmation. The result of this study provided information about magnitude of LBW in HIV-infected pregnancy which is important for further management and study.

Conclusion

The prevalence of low birthweight infants among HIV-infected pregnant women was 12.6%. No association between HIV infection and LBW was found. HAART might be a risk of LBW.

Potential conflicts of interest

None.

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ความชุกของทารกน้ำหนักแรกคลอดน้อยในสตรีตั้งครรภ์ที่ติดเชื้อเอชไอวีที่มาคลอดในโรงพยาบาลราชวิถี

สุวรรณา อัศวพิริยานนท์, สินีพร กสิวัฒน์

***วัตถุประสงค์**: เพื่อศึกษาความชุกของทารกน้ำหนักแรกคลอดน้อยในสตรีตั้งครรภ์ที่ติดเชื้อเอชไอวีที่มาคลอดในโรงพยาบาลราชวิถี และความสัมพันธ์ของการใช้ยาต้านไวรัสกับทารกน้ำหนักตัวน้อย*

***วัสดุและวิธีการ**: รวบรวมข้อมูลสตรีตั้งครรภ์ที่ติดเชื้อและไม่ติดเชื้อเอชไอวีที่มาคลอดในโรงพยาบาลราชวิถี ระหว่าง พ.ศ. 2547-2551 จากกลุ่มงานสูตินรีเวชศาสตร์ และหน่วยเวชระเบียนและสถิติ โรงพยาบาลราชวิถี และสุ่มสตรีตั้งครรภ์ที่ติดเชื้อเอชไอวีที่มาคลอดในช่วงเวลาเดียวกัน จำนวน 200 ราย เพื่อการวิเคราะห์และอธิบาย*

***ผลการศึกษา**: ความชุกของทารกน้ำหนักแรกคลอดน้อยที่คลอดจากสตรีตั้งครรภ์ที่ติดเชื้อเอชไอวี คิดเป็นร้อยละ 12.62 (53/420) และความชุกของทารกน้ำหนักแรกคลอดน้อยที่คลอดจากสตรีตั้งครรภ์ที่ไม่ได้ติดเชื้อเอชไอวี คิดเป็นร้อยละ 13.3 (4,249/31,975) ซึ่งไม่พบความสัมพันธ์ระหว่างการติดเชื้อเอชไอวีกับการเกิดทารกน้ำหนักแรกคลอดน้อยอย่างมีนัยสำคัญทางสถิติ (p = 0.688) ทารกน้ำหนักแรกคลอดน้อยที่คลอดจากสตรีตั้งครรภ์ติดเชื้อเอชไอวีที่ได้รับยาและไม่ได้รับยาต้านไวรัส คิดเป็นร้อยละ 9.9 (7/41) และ 13.6 (19/159) ตามลำดับเมื่อเปรียบเทียบทางสถิติแล้วพบว่าการได้รับยาต้านไวรัสชนิดต่างๆและการไม่ได้รับยาจะมี ความสัมพันธ์ต่อการเกิดทารกน้ำหนักแรกคลอดน้อยอย่างมีนัยสำคัญ (p = 0.021) โดยพบว่าสตรีที่ได้รับยา HAART มีโอกาสที่จะได้ทารกที่มีน้ำหนักแรกคลอดน้อยคิดเป็น 2.27 เท่าของผู้ที่ไม่ได้รับยา*

***สรุป**: ความชุกของทารกน้ำหนักแรกคลอดน้อยที่คลอดจากสตรีตั้งครรภ์ที่ติดเชื้อเอชไอวีคิดเป็นร้อยละ 12.6 ไม่พบความสัมพันธ์ของการติดเชื้อเอชไอวีกับทารกน้ำหนักแรกคลอดน้อย ยาต้านไวรัสชนิด HAART อาจมีผลต่อการเกิดทารกน้ำหนักตัวน้อย*