Prevalence of Rh Negative Pregnant Women Who attended the Antenatal Clinic and delivered in Rajavithi Hospital: 2000-2005

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Objective: *To assess the prevalence of Rh-negative pregnant women who attended the antenatal clinic and delivered in Rajavithi Hospital.*
Material and Method: *A descriptive retrospective study in Rh-negative pregnant women was done. The present study included the general characteristic of cases, anti-D immunoglobulin prophylaxis administration, fetal anemia and neonatal jaundice.*
Results: *During the study period, 147 Rh-negative pregnant women delivered at Rajavithi Hospital. The prevalence of Rh-negative pregnant women in Rajavithi hospital was 0.31%. Fetal anemia and neonatal jaundice were detected in 21.9% and 37.2%, respectively, and 68.14% of cases received antenatal anti-D immunoglobulin. Anti-D immunoglobulin prophylaxis significantly reduced the incidence of neonatal jaundice ($p < 0.05$).*
Conclusion: *The prevalence of Rh-negative pregnant women was 0.31%.*

Keywords: *Rh-negative, Anti-D immunoglobulin prophylaxis, Neonatal jaundice*

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Rh-negative is a rare blood group in Thais compared to Europeans, however, it is still a major problem when isoimmunization occurs. The Rh positive babies whose mothers were Rh-negative have the risk of isoimmunization[1-3]. It causes fetal red blood cells destruction. This increases the rate of neonatal jaundice, fetal anemia, hydrop fetalis and neonatal death[2,3]. Anti-D immunoglobulin prophylaxis is one of the methods in decreasing the rate of Rh isoimmunization and can decrease the chance of neonatal morbidity and mortality[2-5].

At Rajavithi Hospital, routine Rh blood screening in pregnant women was proposed in the year 1997 by the previous chairman of the department of obstetrics and gynecology, but this program had not been evaluated. The purpose of the present research was to study the prevalence of Rh-negative pregnant women at Rajavithi Hospital, antenatal anti-D immunoglobulin prophylaxis. This will serve as the basis for Rajavithi Hospital statistics and the results can be used in the management plan for Rh-negative pregnant women.

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Material and Method

The data was taken from the medical records of medical statistics unit of Rajavithi Hospital and Queen Sirikit Institute of Child Health. The study group was Rh-negative pregnant women who attended the antenatal clinic and delivered in Rajavithi Hospital from January 2000 to April 2005. All cases of Rh-negative pregnant women were reviewed and cases with complete medical records were studied. The present study evaluated the general characteristic of cases such as age, mean gestational age, race, number of pregnancies, history of abortion, the paternal Rh blood group, maternal anti-D antibody screening test and Indirect Coombs', birth weight, and babies' Rh blood group. Neonatal jaundice was also analyzed.

Statistical analysis

The statistic analysis includes mean, standard deviation, Odds ratio and Chi-square test. The p-value of less than 0.05 is statistically significant. The data was analyzed by computer program SPSS Version 11.5.

Results

During the present study period, 46,614 pregnant women attended the antenatal clinic and delivered in Rajavithi Hospital. Of these, 147 cases were Rh-negative. The prevalence of Rh-negative pregnant women in Rajavithi Hospital was 0.31%. Among 147 cases, only 114 cases had complete medical records data and were analyzed. Concerning the races of this group, 91.2% of Rh-negative mothers were Thai, 4.4% were Burmese, and the others were Cambodian, Indian, Laotian, African (unknown races), and Australian. Additionally, 38.6% were primigravida and 61.4% were multigravida. In this study, 75.4% had no history of abortion. The mean maternal age range was 27.31 $\pm$ 6.08 years. The mean gestational age was 38.79 $\pm$ 1.79 weeks; the partners' Rh blood group; Rh positive, Rh-negative, unknown blood group were detected in 81 cases (71%), 1 case (0.9%), 32 cases (28.1%), respectively. Among 114 newborn, the authors found 7 cases (6.1%) of Rh-negative blood group, 104 cases of Rh positive, 3 cases of unknown blood group. The average birth weight was 2997.78 $\pm$ 516.22 grams (Table 1).

The maternal Indirect Coombs' test was negative in 105 cases, weakly positive in 2 cases, positive in 3 cases, and unknown in 4 cases. Anti-D antibody screening test was negative in 104 cases, weakly positive in 1 case, positive in 7 cases, and unknown in 2 cases (Table 2).

Among 114 newborn, fetal anemia and neonatal jaundice were detected in 25 cases (21.9%) and 42 cases (36.8%), respectively. All cases of neonatal jaundice required phototherapy according to antenatal Anti-D immunoglobulin prophylaxis (AADP) and neonatal jaundice. In this group, only 113 babies with a completed medical record were analyzed; there were 77 cases who received AADP and there were 20 cases of neonatal jaundiced. Thirty-six cases did not receive AADP and 22 of them were jaundice. The present study found an association between AADP and neonatal jaundice. Antenatal Anti-D immunoglobulin prophylaxis (AADP) was statistically significant in reducing neonatal jaundice ($p < 0.05$). The risk of neonatal jaundice in whose mother did not receive Rhogam prophylaxis increased 4.48 folds, according to Direct Coombs' test and neonatal jaundice (Table 3). In this group, only 112 babies with a completed medical record were analyzed. The present study showed that Direct Coombs' test was also related to neonatal jaundice statistically significantly. Therefore, in the present study, neonatal jaundice may relate to isoimmunization (Table 4).

Table 1. Baseline characteristics of Rh negative pregnant woman in Rajavithi Hospital (n = 114)

Characteristicsof 114 cases	%
1. Race	
Thai	91.2
Burmese	4.4
Cambodian	0.9
Laotian	0.9
Indian	0.9
others	1.7
2. Gravida	
G1	38.6
G2	39.5
G3	16.7
G4	5.2
3. History of abortion	
Yes	24.6
No	75.4
4. Age (mean$\pm$ SD)	27.31 $\pm$ 6.08 years
5. Gestational age (mean$\pm$ SD)	38.79 $\pm$ 1.79 weeks
6. Birth weight (mean$\pm$ SD)	2997.78 $\pm$ 516.22 grams
7. Baby Rh blood group	
Rh positive	91.2
Rh negative	6.2
Unknown	2.6
8. Paternal Rh blood group	
Rh positive	71
Rh negative	0.9
Unknown	28.1

Table 2. Serology test of 114 Rh negative pregnant women

Serology	% (N)
Indirect Coombs' test	
- Negative	92.1 (105)
- Weakly Positive	1.8 (2)
- Positive	2.6 (3)
- Unknown	3.5 (4)
Anti-D antibody	
- Negative	91.2 (104)
- Weakly Positive	0.9 (1)
- Positive	6.1 (7)
- Unknown	1.8 (2)

Table 3. Anti-D immunoglobulin prophylaxis and neonatal jaundice of 113 newborns

Anti-D immunoglobulin	Jaundice	
	Jaundice	No jaundice
Not received (n = 36)	61.1%	38.9%
Received (n = 77)	26.0%	74.0%
Total (n = 113)	37.2%	62.8%

p-value = 0.000
Odds ratio = 4.48, 95% CI = 1.93-10.39

Table 4. Direct Coombs' test and neonatal jaundice of 112 newborns

Direct Coombs' test	Jaundice	
	Jaundice	No jaundice
Positive (n = 13)	76.9%	23.1%
Negative (n = 99)	32.3%	67.7%
Total (n = 112)	37.5%	62.5%

p-value = 0.002

Discussion

Rh-negative blood group is rare in Thai people. The prevalence of Rh-negative pregnant women who attended the antenatal clinic and delivered at Rajavithi Hospital was 0.31%, which is nearly equal to the prevalence found in Siriraj Hospital between September 1996 and December 1997[1]. This finding is different from the incidence found in Europeans, which is about 15%[2,3].

The authors still have some problems of giving anti D-immunoglobulin to our patients in the proper time because some patients had financial problems and they cannot afford to buy the anti D immunoglobulin. Sometimes the immunuglobulin was not available in the market. Seventy-seven cases received AADP, and in this group, 51 cases received AADP before 28 weeks gestation age and 26 cases received AADP after 28 weeks gestation age. Therefore, management guidelines have to be developed to solve these problems. Moreover, although anti D-immunoglobulin is given at the proper time, Rh sensitization can still occur because small, undetected leaks of fetal blood into the maternal circulation can occur during the third trimester of pregnancy[6].

However, the authors attempted to do the best because it was found that AADP can decrease sensitization from 0.95% to 0.35% and can decrease the rate of fetal loss up to 4.8%[7]. Therefore, AADP is recommended in all indicated cases[8,9]. In the present study, there was a correlation between Anti-D immunoglobulin prophylaxis and neonatal jaundice. AADP was statistically significant in reducing neonatal jaundice ($p < 0.05$). The risk of neonatal jaundice in whose mother that did not receive Rhogam prophylaxis increased 4.48 folds (Table 3). Because of incomplete medical records, it is unable to know the causes of neonatal jaundice such as ABO incompatibility, obstructive jaundice or physiologic jaundice. However, the results of Direct Coombs' test (DCT) were positive in 13 cases. The present study showed that there was a correlation between DCT and neonatal jaundice. Therefore, neonatal jaundice in the present study may relate to isoimmunization (Table 4). In this group, all cases required phototherapy and only one case received blood transfusion. No hydrops fetalis was found in the present study when compared to another study from the Netherlands that required intrauterine transfusion[10].

Conclusion

The prevalence of Rh-negative pregnant women in Rajavithi Hospital was 0.31%. There was a correlation between anti-D immunoglobulin prophylaxis and neonatal jaundice. There was also a correlation between DCT and neonatal jaundice. Further study is required to determine the effect of anti-D immunoglobulin prophylaxis to baby outcome.

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ความชุกของ Rh negative ในสตรีที่ฝากครรภ์และคลอดในโรงพยาบาลราชวิถี พ.ศ.2543-พ.ศ.2548

อภิธาน พวงศรีเจริญ, แสงดาว สุขสวัสดิ์

วัตถุประสงค์*: เพื่อศึกษาถึงความชุกของ Rh negative ในสตรีที่ฝากครรภ์และคลอด ในโรงพยาบาลราชวิถี*
วัสดุและวิธีการ*: เป็นการวิจัยเชิงพรรณาในสตรีที่ฝากครรภ์และคลอดใน ร.พ.ราชวิถี ที่มีผลเลือด เป็น Rh negative จากการบันทึกเวชระเบียน โดยศึกษาเกี่ยวกับลักษณะทั่วไปของมารดาและ ทารก การได้รับ anti-D immunoglobulin prophylaxis ของมารดา ภาวะซีดและภาวะตัวเหลือง ในทารก*
ผลการศึกษา*: ในช่วงเวลาที่ทำการศึกษาพบสตรีที่ฝากครรภ์และคลอดที่มีผลเลือดเป็น Rh negative 147 ราย ความชุกของ Rh negative ของสตรีตั้งครรภ์ในโรงพยาบาลราชวิถีคิดเป็น ร้อยละ 0.31 พบภาวะทารกซีดร้อยละ 21.9 ทารกตัวเหลืองร้อยละ 37.2 มีผู้ได้รับ anti-D immunoglobulin prophylaxis ก่อนคลอด ร้อยละ 68.14 พบว่าการให้ anti-D immunoglobulin มีความสัมพันธ์กับการลดการเกิด neonatal jaundice อย่างมีนัยสำคัญ ($p < 0.05$)*
สรุป*: ความชุกของ Rh negative ของสตรีที่ฝากครรภ์และคลอดที่ ร.พ.ราชวิถี เท่ากับร้อยละ 0.31*