

# Outcome of very low birth weight (VLBW) babies born after attempted criminal abortion

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**Objective** To determine the mortality and short-term morbidities of very low birth weight (VLBW) babies who were born after attempted abortion.

**Material and method** A retrospective study was done by reviewing charts of VLBW babies admitted to Chiang Mai University Hospital within 24 hours of age from January 2004 to December 2007. The mortality rate and morbidities were compared between VLBW babies born after attempted abortion and those in control group.

**Results** Two hundred and twenty two VLBW babies were admitted in the NICU, twenty-five (11.2%) babies were born after attempted abortion. The mothers in abortion group were younger ( $21.1 \pm 3.2$  yrs vs.  $27.9 \pm 6.7$  yrs,  $p < 0.05$ ), had less prenatal care (4.0% vs. 91.8%,  $p < 0.05$ ). Less of them received antenatal steroid (32.0% vs. 58.8%,  $p = 0.038$ ). The mortality rates at 24 hours (4.0% vs. 4.1%,  $p = 0.732$ ), 7 days (16% vs. 10.7%,  $p = 0.304$ ), 28 days (20% vs. 13.2%,  $p = 0.257$ ) and at discharge (20% vs. 14.7%,  $p = 0.33$ ) were not significantly different between two groups. The incidence of respiratory distress syndrome; RDS (92% vs. 65%,  $p = 0.03$ , RR 1.41 95%CI 1.21-1.65), necrotizing enterocolitis; NEC (36% vs. 15.2%,  $p = 0.015$ , RR 2.36 95% CI 1.27-4.39) and sepsis (40% vs. 21.8%,  $p = 0.044$ , RR 1.83, 95% CI 1.06-3.17) were higher in abortion group. Babies in abortion group received breast milk less than those in control group at 7 days (47.1% vs. 64.8%,  $p = 0.002$ ) and 24 hours before discharge. (22.7% vs. 64.7%,  $p = 0.001$ )

**Conclusion** The mortality rate of VLBW babies who were born after attempted abortion was not different from control group. However, they had higher incidence of RDS, NEC and sepsis.

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**Keywords:** very low birth weight babies, criminal abortion, death, morbidity

## Introduction

Induced abortion is illegal in Thailand unless pregnancy arose from sexual abuse or threatened

maternal health. In 1999, 787 government hospitals in the country reported 45,990 abortions, of which 28.5 percent were induced. Among the

mothers who had induced abortion, 47 percent were younger than 25 years old. Socioeconomic problems were the most common reason (60.2%) and the insertion of foreign substances or injection of a liquid solution into the cervical canal (40.6%) was the most common method used [1].

Intention of pregnancy alters the antenatal, perinatal and postnatal outcomes. Mothers with unwanted or unintended pregnancies had less prenatal care and received fewer tetanus vaccinations [2]. In addition, babies who were born from unwanted pregnancies had increased risks of perinatal and neonatal death (1.9% vs. 0.7%, adjusted RR 2.4, 95% CI 1.5-4.0) [3,4]. A recent study also demonstrated that an unwanted pregnancy increased the likelihood of preterm delivery (adjusted OR 1.16, 95%CI 1.01-1.33) and premature rupture of membranes (adjusted OR 1.37, 95%CI 1.01-1.85) [5].

Recent advances in perinatal and postnatal technology increased the survival of preterm babies of less than 1,500 grams dramatically. *Es-cumalha M.* and coworkers found no significant difference in death within 3 months after birth between VLBW in criminal abortion and control groups (21% vs. 26%,  $p = 0.768$ ). However, the VLBW babies in the abortion group had higher incidences of patent ductus arteriosus (PDA) (58% vs. 29%,  $p = 0.031$ ), bronchopulmonary dysplasia (BPD) (47% vs. 14%,  $p = 0.026$ ), abnormal neurodevelopment (50% vs. 16%,  $p = 0.026$ ) and cerebral palsy (29% vs. 3%,  $p = 0.015$ ) [6].

The aim of this study was to determine the mortality rate and short-term morbidities of VLBW babies, who were born after attempted criminal abortions in Chiang Mai University Hospital.

## Materials and methods

A retrospective study was performed, reviewing preterm babies that weighed less than 1,500 grams (Very Low Birth Weight; VLBW), and were admitted to the NICU at Chiang Mai University Hospital within 24 hours after birth from January 1, 2007 to December 31, 2009. Babies born after attempted illegal abortions were assigned to the abortion group and those born under other circumstances formed the

control group. This study calculated the mortality rates and short-term morbidities including respiratory distress syndrome (RDS), patent ductus arteriosus (PDA), necrotizing enterocolitis (NEC) stage 2 or 3, retinopathy of prematurity (ROP), intraventricular hemorrhage (IVH)  $\geq$  gr.3, periventricular leucomalacia (PVL), bronchopulmonary dysplasia (BPD), sepsis, abnormal hearing screen, polycythemia, anemia and congenital anomaly, and compared the outcomes between the two groups using the Chi-square and Fisher's exact tests for quantitative and qualitative data, respectively.

RDS was diagnosed clinically and accompanied by a typical chest film, which had either a ground-grass appearance or air bronchogram. PDA was diagnosed clinically by presenting of systolic ejection murmurs at the left upper sternal border the presence of increased pulmonary blood flow and cardiomegaly on the chest film. NEC was diagnosed clinically, and radiographic signs were in accordance with modified Bell's staging criteria [7]. BPD was diagnoses using the National Institutes of Health (NIH) criteria [8]. Sepsis was diagnosed as either clinically suspected or positive blood culture, and IVH and PVL were diagnosed by ultrasonography, which is a routine screening device in the unit of this study.

## Results

During a three-year period, 226 VLBW babies were admitted to the NICU at Chiang Mai University Hospital. Four of them were excluded for being more than 24 hours old at admittance. Twenty-five of the remaining 222 babies (11.2%) were born after attempted illegal abortion, and 195 (87.8%) were born under other circumstances. The demographic data are shown in Table 1. Mothers in the abortion group were younger ( $21.1 \pm 3.2$  vs.  $27.9 \pm 6.7$ ,  $p < 0.001$ ), had less antenatal care (4% vs. 91.8%,  $p < 0.001$ ), fewer cesarean sections (0% vs. 47.72%,  $p < 0.001$ ) and received less prenatal steroids (32.0 % vs. 58.9%,  $p = 0.038$ ) than those in the control group. Sixty-eight percent of preterm babies in the abortion group were born at Chiang Mai University Hospital, 20 percent at home and 12 percent at other hospitals. Fewer babies in the abortion group received more than 50 percent intake of breast milk at seven days of life (47.6% vs. 64.8%,  $p = 0.002$ ) or 24 hours prior to discharge (22.7% vs. 64.7%,  $p = 0.002$  RR 1.83, 95%CI 1.06-3.17).

The mortality rates are shown in Table 2.

There was no significant difference in the overall mortality rate between the abortion and control group (20% vs. 14.7%,  $p$  0.33, RR 1.36 95%CI 0.58-3.19), as well as the mortality rate within the first 24 hours (4.0% vs. 4.1%,  $p$  0.732, RR 0.99, 95%CI 0.13-7.56), seven days (16.0% vs. 10.7%,  $p$  0.304, RR 1.50, 95%CI 0.56-4.02) and 28 days (20% vs. 13.2%,  $p$  0.257, RR 1.52, 95%CI 0.64-3.59).

In short-term outcomes, babies in the abortion group had a significantly increased incidence of

RDS (92% vs. 65%,  $p$  0.003, RR 1.42, 95%CI 1.21-1.65), NEC (36.0% vs. 15.2%,  $p$  0.015, RR 2.36, 95%CI 1.27-4.39) and sepsis (40.0% vs. 21.8%,  $p$  0.044, RR 1.83, 95%CI 1.06-3.17) (Table 2). The abortion group also had a longer intubation period (17.7+24.7 vs. 24.7+8.2 days,  $p$  0.008) and longer duration of oxygen use (66.6 + 67.6 vs. 44.3+49.2 days,  $p$  0.043). Neither length of stay nor hospital expense was found to be different between the two groups.

**Table 1.** Demographic data

	Abortion group (n=25)	Control group (n=197)	<i>p</i>
Gestational age (wk, mean ± SD)	28.7±2.1	29.50±2.5	0.432
Birth weight (gm, mean ± SD)	1,060.00±254.54	1,102.16±252.17	0.133
Male (n, %)	12 (48.0)	124 (62.94)	0.111
Maternal age	21.1±3.2	27.9±6.7	<0.001
Prenatal care (%)	1 (4.0)	181 (91.8)	<0.001
Place of birth			0.002
Inborn (n, %)	17 (68.0)	173 (87.8)	
Home or outside hospital (n, %)	3 (12.0)	3 (1.5)	
Referred from another hospital (n, %)	5 (20.0)	22 (1.20)	
Cesarean section (n, %)	0(0)	94 (47.72)	<0.001
Apgar score at 5 minutes < 7 (n, %)	9 (39.13)	41 (21.35)	0.055
Antenatal steroid (%)	8 (32.00)	116 (58.88)	0.038
Length of stay (mean± SD)	71.7±68.4	63.5±48.9	0.45
Hospital cost, Thai baht (mean±SD)	308,171.48±293,782.40	241,247.70±230,625.62	0.188
Received > 50% breast milk at 7 days of life (%)	8/17 (47.1)	116/179 (64.8)	0.002
Received > 50% breast milk 24 hrs before discharge (%)	5/22 (22.7)	119/184 (64.7)	0.001

**Table 2.** Comparison of mortality rates between the abortion and control group

	Abortion group (n=25)	Control group (n=197)	<i>p</i>	Relative risk (95%CI)
Death at NICU discharge (n, %)	5 (20)	29 (14.7)	0.330	1.36 (0.58-3.19)
Death within 24 hours (n, %)	1(4)	8 (4.1)	0.732	0.99 (0.13-7.56)
Death within 7 days (n, %)	4 (16)	21 (10.7)	0.304	1.50 (0.56-4.02)
Death within 28 days (n, %)	5 (20)	26 (13.2)	0.257	1.52 (0.64-3.59)

## Discussion

Because of recent advances in neonatal management, VLBW babies have an improved survival rate as compared to the past. In this study, the survival rate among these babies was 85%. This value is lower than the mortality rate in developed countries [9, 10]. Attempted illegal abortions resulted in 11 percent of preterm births in the NICU at Chiang Mai University Hospital, as compared to 6 percent in a Portuguese study [6]. Mothers in the abortion group were younger, had less antenatal care, and fewer cesarean sections than those in the control group, and this pattern is similar to that observed in previous studies [1, 2]. The most common method of induced abortion is misoprostol vaginal insertion (88%); the use of which has increased widely in developing and developed countries [11, 12]. Misoprostol, a prostaglandin inhibitor, is indicated for peptic and duodenal ulcer treatment; nevertheless, it is used increasingly among obstetricians for cervical ripening and induction of labor [13]. Despite misoprostol being limited to only intra-hospital use in Thailand, it is sold illegally in some clinics and drug stores for inducing abortion in women who want to terminate an unwanted or unplanned pregnancy.

No significant differences were found in the perinatal, neonatal and mortality rates between VLBW babies in the attempted illegal abortion and control groups. This is possibly because most babies in both groups were born intra-hospital, in which case they certainly had prompt resuscitation and received the same standard treatment including surfactant, respiratory support and medication. However, babies in the abortion group had significantly increased adverse outcomes including RDS, NEC and sepsis. These outcomes can be prevented by using antenatal steroid. The Cochrane analysis, published in 2006, demonstrated that antenatal steroid reduced the incidence of neonatal death (RR 0.69, 95% CI 0.58-0.81), RDS (RR 0.66, 95% CI 0.59-0.73), NEC (RR 0.46, 95% CI

0.29-0.74), and systemic infections in the first 48 hours of life (RR 0.56, 95% CI 0.38- 0.85) [14]. In addition, antenatal steroid was associated with reduced vasopressor administration in extremely premature babies [15], and this was seen also in this study. It was found in this study that babies in the abortion group received less antenatal steroid when compared to the control group, as mothers in the former group often delayed presenting themselves at the hospital until they were in active labor. Furthermore, unwanted pregnancy and attempted abortion also affect decisions of the obstetrician in terms of survival rate and long term outcomes of the baby. However, since incomplete courses of antenatal corticosteroids can decrease postnatal complications of prematurity [16], they should be considered at all times unless immediate delivery is anticipated.

Breast milk also prevents NEC and sepsis [17-19]. As shown in Table 3, fewer babies in the abortion group received more than 50 percent intake of breast milk at seven days of life or 24 hours prior to discharge. Almost all mothers in the abortion group were teenagers and students, so they were unable to maintain milk supplies throughout their admission. This study found no significant differences of PDA, BPD and severe IVH between the two groups, the diagnosis of PDAs was mostly clinical. Therefore, asymptomatic PDAs may be underestimated. This study used NIH consensus definition of BPD, which is based on severity and correlated to long-term pulmonary outcome [20]. The babies in the abortion group tended to have higher incidences of BPD and severe BPD. The duration of intubation and oxygen use was also significantly longer in this group. This study was limited by incomplete results of IVH, PVL, ROP and hearing screen.

In conclusion, VLBW babies, who were born after attempted illegal abortion, did not have a significantly higher mortality rate than other VLBW babies, but their incidences of RDS, NEC and sepsis had higher significance.

**Table 3.** Comparison of complications and treatments between the abortion and control group

	Abortion group (n=25)	Control group (n=197)	<i>p</i>	Relative risk (95%CI)
RDS (n, %)	23 (92.0)	128 (65.0)	0.003	1.41 (1.21-1.65)
Surfactant therapy (n, %)	9 (36.0)	59 (29.9)	0.342	1.20 (0.68-2.11)
PDA (n, %)	19 (76.0)	123 (62.4)	0.133	1.22 (0.95-1.56)
NEC (n, %)	9 (36.0)	30 (15.2)	0.015	2.36 (1.27-4.39)
Sepsis (n, %)	10 (40.0)	43 (21.8)	0.044	1.83 (1.06-3.17)
Hypotension within the first 24 hours (n, %)	10 (40.0)	58 (29.4)	0.196	1.36 (0.80-2.30)
Anemia or polycythemia (n, %)	5 (20.0)	40 (20.3)	0.605	0.99 (0.43-2.26)
Hypoglycemia (n, %)	1 (4.0)	12 (6.1)	0.557	0.66 (0.89-4.84)
Congenital anomaly (n, %)	3 (12.0)	19 (9.6)	0.463	1.24 (0.40-3.91)
BPD (n, %)	17 (68.0)	97 (49.2)	0.059	1.38 (1.02-1.87)
Severe BPD (n, %)	4 (16.0)	11 (5.6)	0.073	2.87 (0.99-8.32)
IVH > grade 3 (n, %)	6/23 (26.1)	22/170 (12.9)	0.165	1.81 (0.80-4.08)
PVL (n, %)	1/22 (4.6)	3/167 (1.8)	0.401	2.46 (0.27-22.71)
Abnormal hearing screening, OAE (n, %)	4/17 (23.5)	32/141 (22.7)	0.574	1.03 (0.40-2.63)
ROP (n, %)	8/20 (40.0)	26/142 (18.3)	0.09	1.85 (0.93-3.66)
Intubation (days)	17.7+24.7	8.2+14.9	0.008	
Duration of oxygen (days)	66.6+67.6	44.3+49.2	0.043	

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ผลการรักษาการกลอດก่อนกำหนดน้ำหนักน้อยกว่า 1,500 กรัม ที่เกิดจากการดำเนินการพิเศษอย่างต่อเนื่อง

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วัตถุประสงค์ ศึกษาอัตราการตายและภาวะแทรกซ้อนของทารกคลอดก่อนกำหนดน้ำหนักน้อยกว่า 1,500 กรัม ที่เกิดจากมารดาทำแท้งผิดกฎหมาย

วิธีการวิจัย เป็นการศึกษาแบบเก็บข้อมูลข้อมูลหลังจากประวัติการรักษาผู้ป่วยที่เข้ารับการรักษาในพ.ตั้งแต่ 1 มกราคม 2550 ถึง 31 ธันวาคม 2552 เก็บข้อมูลเฉพาะผู้ป่วยหารากคลอดก่อนกำหนดน้ำหนักน้อยกว่า 1,500 กรัม ที่เข้ารับการรักษาในหอผู้ป่วยทางแรกระเกิดภายใน 24 ชั่วโมงแรกหลังคลอด ศึกษาอัตราการตาย และภาวะแทรกซ้อนของทารกที่เกิดหลังการคลอดทันที ผิดกฎหมายเทียบกับทารกที่เกิดจากสามาหนอดอื่น

ผลการศึกษา ในช่วงระยะเวลาดังกล่าวมีการกลดลดก่อนกำหนดน้ำหนักน้อยกว่า 1,500 กรัม จำนวน 222 ราย ที่เข้าเกณฑ์การศึกษา เป็นการที่เกิดหลังจากมารดาทำแท้ทึ่งผิดกฎหมายจำนวน 25 ราย (ร้อยละ 11.2) พบว่ามารดาคุณพ่อที่ทำแท้ทึ่งผิดกฎหมายมีอายุน้อยกว่า ( $21.1 \pm 3.2$  ปี,  $27.9 \pm 6.7$  ปี,  $p < 0.001$ ) ได้รับการฝ่ากอร์กน้อยกว่า (ร้อยละ 4.0, ร้อยละ 91.8,  $p < 0.001$ ) ได้รับสเตียรอยด์ก่อนคลอดน้อยกว่า (ร้อยละ 32.0, ร้อยละ 58.8,  $p = 0.038$ ) และ ได้รับการผ่าตัดคลอดน้อยกว่า (ร้อยละ 0, ร้อยละ 41.7,  $p < 0.001$ ) จำนวนการที่ได้รับน้ำนมแม่มากกว่าร้อยละ 50 ของอาหารทั้งหมดมีค่าต่ำกว่าในกลุ่มที่มารดาทำแท้ทึ่งผิดกฎหมาย ทั้งที่ระยะเวลา 7 วันหลังคลอด (ร้อยละ 47.06, ร้อยละ 64.8,  $p = 0.002$ ) และก่อนกำหนดน้ำหนักต่ำจากโรงพยาบาล (ร้อยละ 22.73, ร้อยละ 64.67,  $p = 0.001$ ) อัตราการตายภายในอายุ 7 วันแรก (ร้อยละ 4.0, ร้อยละ 4.1,  $p = 0.732$ ), 14 วันแรก (ร้อยละ 17.0, ร้อยละ 10.7,  $p = 0.304$ ) และ 28 วันแรก (ร้อยละ 20.0, ร้อยละ 13.2,  $p = 0.257$ ) ไม่แตกต่างกันระหว่างการทั้งสองกลุ่ม ทางรทที่เกิดหลังจากมารดาทำแท้ทึ่งผิดกฎหมายมีอัตราการเกิดภาวะแทรกซ้อนดังต่อไปนี้มากกว่าการกลดลดคุณคุณคุณ ได้แก่ ภาวะหายใจลำบาก (respiratory distress syndrome; RDS) (ร้อยละ 92, ร้อยละ 65,  $p = 0.003$ , RR 1.42, 95%CI 1.21-1.65) คำใส่เน่าปีอิย (necrotizing enterocolitis; NEC) (ร้อยละ 36.0, ร้อยละ 15.2,  $p = 0.015$ , RR 2.36, 95%CI 1.27-4.39) และติดเชื้อในกระแสเลือด (sepsis) (ร้อยละ 40, ร้อยละ 21.8,  $p = 0.044$ , RR 1.83, 95%CI 1.06-3.17)

สรุป ทำการคลอดก่อนกำหนดน้ำหนักน้อยกว่า 1,500 กรัม ที่เกิดหลังจากมารดาทำแท้งคิดกูหมาย มีอัตราตายไม่ต่างจากทำการคลอดก่อนกำหนดน้ำหนักน้อยรายอื่น อย่างไรก็ตามพบว่าทำการคลุ่มนี้มีอัตราการเกิด RDS, NEC และ sepsis สูงกว่าทำการคลอดก่อนกำหนดน้ำหนักน้อยที่เกิดจากสาเหตุอื่น เชียงใหม่วชรา 2556;52(1-2):17-22.

**คำสำคัญ:** ทางคุณลอดก่อนกำหนดน้ำหนักน้อยมาก ทำแท้ที่พิจิกหมาย อัตราการตาย ภาวะแทรกซ้อน