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Efficacy of Intraumbilical Vein Methylergonovine Maleate on Duration of Third Stage of Labor

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ABSTRACT

Objective: To study the efficacy of intraumbilical vein Methylergonovine maleate on duration of third stage of labor.

Materials and Methods: Eighty-four term pregnant women undergoing vaginal delivery at Ramathibodi Hospital without risk factors were randomly assigned to receive 1 ml of Methylergonovine maleate (0.2 mg/ml) plus 0.9%NaCl 19 ml (n=42) or 0.9%NaCl 20 ml (n=42) by intraumbilical vein injection within one minute after cord clamping. Placenta was delivered by control cord traction technique. The duration of third stage of labor and side effects at one hour later were analysed.

Results: There were no statistically significant difference among 2 groups regarding age, gestational age, parity, birth weight, placental weight and estimated blood loss. The duration of third stage of labor in Methylergonovine maleate group showed no statistically significant difference in compare with 0.9% NaCl group (5.97±3.28 Vs 6.53±4.56 minutes respectively, P>0.05). No side effects were observed in both groups.

Conclusions: Intraumbilical vein Methylergonovine maleate had no effected on the duration of third stage of labor.

Keywords: methylergonovine, intraumbilical vein, duration of third stage

Introduction

Postpartum hemorrhage is the major cause of maternal mortality. WHO report that obstetrics hemorrhage cause 127,000 deaths annually worldwide[1]. Retained placenta is one of cause for postpartum hemorrhage. A lengthy third stage of labor is associated with increase hemorrhagic morbidity and therapeutic intervention, including curettage and manual removal of the placenta. Active management of third stage of labor can reduce blood loss. Traditionally injection of oxytocin and methylergonovine intravenously or intramusculary have been used as uterotonic agents for postpartum hemorrhage prophylaxis.

In 1983, Golan et al[2] described a new method for the management of retained placenta. Ten parturients, each of whose third stage exceeded 30 minutes, were treated with 10 U of oxytocin into the umbilical vein of the placenta. All ten placentas were

expelled within five minutes of the injection. Unfortunately, there was no control group in this study.

The intraumbilical oxytocin is effective in treating the retained placenta, the mechanism involve diffusion of oxytocin from the villous vessels into the intervillous space, with subsequent local myometrial contractions, leading to shearing of placental attachments. This effect may be easily demonstrated immediately after delivery when the relationship between the placental villi and the intervillous space remains relatively undisturbed[3]. Several studies of intraumbilical oxytocin in management of third stage were published with controversial results[2,4-6]. There are limit on intraumbilical methylergonovine for management of third stage.

Methylergonovine, one of uterotonic drug, is the semi-synthetic ergot alkaloid acts directly on uterine smooth muscle cell. Intravenous or intramuscular injection have been used for active management of third stage of labor but high incidence of side effects such as increase blood pressure, severe abdominal cramping, nausea and vomiting.

We studied intraumbilical methylergonovine in normal pregnancies without retained placentas as an alternative to the traditional management of the third stage of labor. The objective of this study was to determine the efficacy of intraumbilical vein methylergonovine maleate on duration of third stage of labor.

Materials and Methods

Eighty four term singleton pregnant women who underwent vaginal delivery at Ramathibodi Hospital between October 2010 and July 2011 were enrolled. Women were excluded from the study if they had death fetus, disease of placenta and umbilical cord, placenta previa or low-lying placenta, parity more than five, premature rupture of membranes (PROM) more than 12 hours, preeclampsia, had sign of placental separation, bad obstetrics history, medical complications or allergy to ergot alkaloid. Informed consent was obtained from all patients before delivery. They were then randomized by computer program into two groups. This study was approved by the Ethical Committee of Ramathibodi Hospital, Mahidol University.

Pilot study was performed and the sample size was calculated by two mean difference formula. Eighty-four participants were enrolled for this study.

Patients were randomized into two groups by computer randomization then were followed though the first and second stages of labor. All deliveries were performed by residents. In the third stage, all patients received oxytocin 10 units in 5%DN/2 1000 ml intravenously at 120 ml/hr. Within 1 minute after cord clamping, 20 ml of solution containing methylergonovine or placebo was injected into the umbilical vein of the placenta, just proximal to the cord clamp at the level of vulva. The 42 subjects received 1 ml of Methylerginovine maleate(0.2 mg/ml) diluted in 19 ml of normal saline solution, whereas the 42 subjects received 20 ml of normal saline solution. The solutions were prepared by the nurse and unlabeled. The placenta was delivered by control cord traction technique.

The length of the third stage of labor was recorded for each subject. Additional data include side effects of the drug, such as hypertension, headache, nausea and vomiting, abdominal cramping were recorded.

Data were analyzed $p<0.05$ was statistically significant difference.

Results

Demographic data comparing age, gestational age, gravidity showed no statistically significant differences between the methylergonovine group and control group (Table1). Labor characteristics of both groups did not differ with respect to birth weight, placental weight and estimate blood loss (Table2) methylergonovine group had mean third stage duration of 5.97±3.28 minutes, as compared with 6.53±4.56 minutes in the control group ($p > 0.05$). No side effects were observed in both groups.

Table 1. Demographic data

	Methylergonovine N=42	Control N=42	p-value
Age(yr)*	26.69±5.83	26.71±4.06	0.98
GA(days)*	271.76±8.62	271.09±8.49	0.72
Gravida(%)			
1	29	38	
2	16	10	
3	3	1	

*Mean ± SD

Table 2. Labor and delivery data

	Methylergonovine N=42	Control N=42	p-value
Birth weight(g)*	3033.33±370.92	2963.09±378.56	0.39
Placental weight(g)*	698.57±123.91	653.80±118.87	0.09
Estimate blood loss(ml)*	261.90±51.57	245.23±68.79	0.21
Duration of third stage(minutes)*	5.97±3.28	6.53±4.56	0.52
Side effects	0	0	

*Mean ± SD

Discussion

The third stage of labor is usually managed by observation until separation and expulsion occurs. Intravenous oxytocin is then given to reduce hemorrhage. Retained placenta is one of the serious complications of the third stage of labor. Hemorrhage and infection may occurand may cause maternal death. Manual removal of the retained placenta is the current treatment and is performed under general anesthesia. However, this procedure may result in infection, uterine rupture, hemorrhage, or trauma to the uterine cervix and also anesthetic complications. There are several reports suggesting that injection of a solution containing oxytocin into the umbilical cord might reduce the need for manual removal of the retained placenta and cause spontaneous placental expulsion[2,4-7].

Our study is the trial of intraumbilical methylergonovine on duration of third stage. Methylergonovine group had mean third stage duration of 5.97±3.28 minutes, as compared with 6.53±4.56 minutes in the control group (p>0.05). The result showed shortened on duration of third in methylergonovine group when compared with control group but no statistically significant. One explanation of the results could be the small sample sizes in the trials. The strength of this study was no side effects were observed.

There are limited data of intraumbilical methylergonovine on the normal third stage to compare with this study. There were some study in intraumbilical oxytocin on duration of third stage one study have found the method to be advantageous[4] whereas others have not[3].

In 1988 Young et al[3] studied the efficacy of intraumbilical oxytocin on the third stage of labor in 50 normal parturients. Either 10 units of oxytocin diluted to 20 ml in normal saline (25 subjects) or 20 ml of normal saline alone (25 subjects) was injected into the placental

circulation within one minute after cord clamping. The mean duration of the third stage was 4.1±2.0 minutes in saline-treated subjected and 4.6±3.4 minutes in those treated with oxytocin. They concluded that intraumbilical oxytocin was not effective in shortening the normal third stage of labor.

In 1989 Reddy et al[4] use of intraumbilical vein injection of oxytocin compared with traditional management of the third stage of labor on puerperal blood loss and length of the third stage of labor. They found shorter third stage of labor (4.1 versus 9.4 minutes) and concluded that intraumbilical vein oxytocin appears to be a useful alternative to traditional management of the third stage of labor.

The mechanism by which injection of uterotonic drug into the umbilical vein is supposed to aid in the separation of a placenta is unclear. Some have postulated that the amount of the drug, the volume of the solution injected, the mechanical effect of the injection of the solution and the timing of the injection[4,7-10]

We conclude that intraumbilical methylergonovne is not effective in shortening the normal third stage of labor and require for further study in larger sample size or study in case of retained placenta.

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ผลของการให้ Methylergonovine maleate ทางเส้นเลือดดำสายสะดือต่อการคลอดระยะที่สาม

ธิดารัตน์ พรหมบุตร, อภิชาติ จิตต์เจริญ, สมศรี พิทักษ์กิจรณกรณ์

วัตถุประสงค์ *: เพื่อศึกษาถึงประสิทธิภาพของยา Methylergonovine maleate ต่อเวลาการคลอดระยะที่สาม*

วัสดุและวิธีการ *: สตรีตั้งครรภ์ที่มีอายุครรภ์มากกว่าหรือเท่ากับ 37สัปดาห์ ที่มาคลอดทางช่องคลอดที่โรงพยาบาลรามาธิบดี ระหว่างเดือนตุลาคม 2553 ถึงเดือนกรกฎาคม 2554 จำนวน 84 ราย แบ่งอาสาสมัครเป็นสองกลุ่มโดยใช้วิธีการสุ่มด้วยคอมพิวเตอร์ หลังจากอธิบายถึงขั้นตอนการการดำเนินงานวิจัย ผลข้างเคียงของยาที่จะเกิดขึ้นภายหลังจากที่ทารกคลอด และเก็บเลือดกลุ่มแรก 42 รายฉีด Methylergonovine maleate ขนาด 0.2 mg/ml 1 ml ผสมกับ 0.9% NaCl 19 ml ทางเส้นเลือดดำสายสะดือ กลุ่มที่สอง ฉีด 0.9% NaCl 20 ml ทางเส้นเลือดดำสายสะดือ โดยทั้งสองกลุ่มทำการคลอดรกด้วยวิธี Control cord traction จากนั้นจึงจับเวลาการคลอดระยะที่สามและบันทึกผลข้างเคียงที่เกิดขึ้น*

ผลการวิจัย *: เวลาการคลอดระยะที่สามในกลุ่มที่ได้รับ Methylergonovine maleate เท่ากับ 5.97±3.28 นาที ในกลุ่มที่ไม่ได้รับยาเท่ากับ 6.53±4.56 นาที แต่ไม่มีความแตกต่างกันในทางสถิติและไม่พบผลข้างเคียงในทั้งสองกลุ่ม*

สรุป *: Methylergonovine maleate ที่ให้ทางเส้นเลือดดำสายสะดือไม่มีผลต่อเวลาการคลอดระยะที่สาม*