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# Effect on Postpartum Hemorrhage of Prophylactic Oxytocin

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**Abstract: Objective:** To analyze the effects of postpartum prophylactic use of oxytocin on reducing the incidence of postpartum hemorrhage. **Methods:** 220 cases of maternal patients admitted in our hospital from December 2015 to December 2016 were selected as the subjects. According to the random number table method, the control group and the observation group were divided into 110 cases respectively. Control group was given intravenous injection of 20U oxytocin after fetal delivery to prevent postpartum hemorrhage; observation group was given intravenous injection of combination oxytocin and misoprostol for prevention of postpartum hemorrhage. The levels of serum calcium, D-dimer, fibrin (FIB), postpartum hemorrhage at 2, 24 hours and the duration of the third stage of labor were compared between the two groups. The adverse reactions and complications of the two groups were compared, to evaluate the efficacy and safety of misoprostol combined with oxytocin to prevent postpartum hemorrhage. **Results:** There was no significant difference in blood calcium level between the two groups after delivery (P> 0.05). The D-dimer in the observation group was lower than that in the control group, the FIB level of observation group was also higher than that of the control group, and the difference was significant (P <0.05). Postpartum hemorrhage at 2, 24 hours in the observation group was lower than that in the control group (P <0.05), and the third stage of labor in the observation group was shorter than that in the control group (P <0.05). After treatment, two groups of maternal showed less adverse reactions, and mild symptoms of adverse reactions, no complications, the difference between groups was not statistically significant (P> 0.05). **Conclusion:** Oxytocin combined with misoprostol can reduce maternal postpartum hemorrhage, worthy of clinical promotion.

**Key words:** oxytocin; postpartum hemorrhage; incidence

Postpartum hemorrhage refers to maternal bleeding within 24 hours of continuous bleeding to 500mL or more hemorrhagic complications, if the bleeding occurs in the short-term, it may lead to shock, death and other fetal consequences which will threaten mother's life. Epidemiological studies had shown that postpartum hemorrhage is one


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of the leading causes of maternal mortality in China, and is the most important factor contributing to maternal mortality. This is particularly true in areas where health conditions are weak. There are many factors leading to postpartum hemorrhage, in addition to the most common postpartum uterine inertia factors, such as placenta, birth canal injury, and placental abruption, amniotic fluid embolism caused by clotting disorders that can lead to postpartum hemorrhage. Because of postpartum hemorrhage has high mortality, so the choice of safe and effective prevention and treatment can significantly reduce maternal postpartum hemorrhage and mortality. Oxytocin for the treatment of postpartum hemorrhage first-line medication, the principle is strongly promote the uterine contraction, through the uterine contraction of the way to play the effect of hemostasis. Although effectiveness and safety of oxytocin in the prevention and treatment of postpartum hemorrhage has been generally recognized, but clinical practice found there were cases with poor hemostatic effect after using maternal oxytocin. Misoprostol is a synthetic prostaglandin PGE1 derivative, in recent years found that the drug for postpartum hemorrhage treatment have a certain effect. In this paper, oxytocin combined with misoprostol drug treatment to maternal postpartum hemorrhage prevention, in order to observe the effect of these two drugs combination with the application of oxytocin efficacy and safety differences for the prevention and treatment of clinical postpartum hemorrhage to provide more multi-clinical data, the results are reported below.

# 1. Materials and methods

## 1.1 General information

220 cases of maternal hospital admitted in our hospital from December 2015 to December 2016 were selected as the study group, and 110 cases were divided into control group and observation group according to the random number table method. The average age of maternal average was (26.8 ± 4.2) years, 80 cases were primi-para and 30 cases were maternal, the average gestational age was (40.56 ± 2.02) weeks; the average age of the control group was (28.8 ± 3.6) 85 cases were primi-para, 25 cases were maternal, the average gestational age was (40.46 ± 2.13) weeks. There was no statistical difference between the two groups (P> 0.05). There was no significant difference between the two groups (P> 0.05).

## 1.2 Methods

Continuous provided uterine massage for 2 groups, then the control group of patients with oxytocin treatment. 20U of the solution was added into 500mL of saline, and then intravenous infusion. If the phenomenon of bleeding patients did not get effective control, emergency rescue, immediately press the uterus, uterine contraction, including oxytocin intravenous into the pot, intramuscular injection Hemabate, if conservative treatment of conventional drugs failed, immediately uterine compression hemostasis, using modified β-lynch suture, can retain reproductive function, while blood transfusion. If still fail, implementation of hysterectomy. Patients in the observation group were treated with additional appropriate amount of misoprostol, allowing the patient to take 200U misoprostol orally. Then the two groups of patients postpartum 2h and 24h bleeding was observed and recorded.

## 1.3 Observe indicators

The duration of postpartum hemorrhage and the incidence of postpartum adverse reactions were recorded at the time of postpartum hemorrhage at 2, 12 and 24 hours.

## 1.4 Postpartum hemorrhage measurement method

The amount of postpartum hemorrhage is the result of using the weighing method and the volumetric method. Postpartum hemorrhage within 24 hours after delivery greater than 500ml determined to postpartum hemorrhage. The main process of weighing method: the delivery of the fetus, the exhausted amniotic fluid, the waterproof pad placed in

the maternal hip, the collection of blood, weighing and calculate the difference between the paper pad before and after the blood, according to 1.05g difference is 1mL of bleeding volume; calculating volume process: the maternal hip placed under the blood pool, collecting blood, according to the blood on the basin scale, the amount of bleeding directly. The total amount of bleeding is calculated in two ways.

### 1.5 Statistical processing

SPSS17.0 statistical software for data processing analysis, quantitative data to ($x \pm s$) that the comparison between groups using t test, qualitative data between the groups using $\chi 2$ test, $P < 0.05$ for the difference was statistically significant.

## 2. Results

### 2.1 Comparison of serum calcium, D-dimer and FIB levels in two groups after maternal delivery

There was no significant difference in serum calcium content between the two groups ($P > 0.05$). The level of D-dimer in the observation group was lower than that in the control group, and the level of FIB was higher than that of the control group ($P < 0.05$), the specific data in Table 1.

Table 1 Comparison of serum calcium, D-dimer and FIB levels in two groups ($n = 100$, $x \pm s$)

| Group | Serum calcium (mmol/L) | D-dimer (μg/L) | FIB (g/L) |
|---|---|---|---|
| Observation group | 2.19 ±0.18 | 0.15 ±0.88 | 3.41 ±0.56 |
| Control group | 2.28±0.30 | 2.12 ±1.04 | 2.89 ±0.88 |
| P | > 0.05 | < 0.05 | < 0.05 |

### 2.2 Two groups of maternal postpartum hemorrhage 2 and 24 hours and the third time of labor comparison

($P < 0.05$), and the third stage of labor in the observation group was also shorter than that in the control group ($P < 0.05$), and the results were shown in Table 2.

Table 2

| Group | Blood volume postpartum 2 hours (ml) | Blood volume postpartum 24 hours (ml) | Third stage duration (min) |
|---|---|---|---|
| Observation group | 158.7 ±65.3 | 203.8 ±76.8 | 7.4 ±1.9 |
| Control group | 223.5 ±78.9 | 338.4 ±108.9 | 10.2 ±3.8 |
| P | < 0.05 | < 0.05 | < 0.05 |

### 2.3 Two groups of maternal adverse reactions and complications occurred in the situation

After treatment, the two groups of maternal had less adverse reactions, no other complications, and adverse reactions were mild, the observation group had 1 case of maternal fever, 2 cases of maternal symptoms of nausea; control group had fever in 1 case, nausea in 1 case. There was no significant difference in the incidence of adverse reactions between the two groups ($P > 0.05$).

## 3. Discussion

Postpartum hemorrhage is 2 h after delivery of maternal bleeding in more than 400mL, or 24 hours after fetal delivery with maternal bleeding in more than 500mL. Postpartum hemorrhage is the main cause of maternal death. In the total number of childbirth, the incidence of postpartum hemorrhage as high as 2%, a serious threat to maternal health. Abnormal blood function, placental factors, uterine atrophy, birth canal injury is the main cause of postpartum hemorrhage, and uterine contraction failure is the main cause of postpartum hemorrhage, so the prevention of postpartum hemorrhage symptoms is the most important way to prevent maternal postoperative uterine weakness.

Maternal uterine muscle fiber degeneration, dysplasia and maternal labor extension, maternal failure, urinary retention, excessive using of anesthesia resulting in failure of uterine contraction caused postpartum hemorrhage. Placental stripping surface is the main source of postpartum hemorrhage, postpartum hemostasis mechanism is determined by the blood coagulation mechanism and the structural characteristics of uterine muscle fibers. When the uterine muscle was contracting, prostaglandin and oxytocin would be secreted and play a role in uterine contraction after placental delivery. Uterine contraction when the vertical and horizontal arrangement of muscle fibers crossed each other, the uterine vessels between muscle fibers would be compressed, and cause rapid closure of uterine blood vessels, so achieve the purpose of hemostasis.

Among all prevention of postpartum hemorrhage drugs, the most common used is oxytocin. Oxytocin is a kind of peptide hormone, with rapid onset, rapid metabolism, high safety, low price advantages, recommended by WHO for prevention and treatment of postpartum hemorrhage. It can be secreted from the body pituitary gland, containing components that can promote contractions, the clinical effect is obvious, usually can reduce about 40.2% of postpartum hemorrhage. At the same time, can selectively stimulate the uterus, enhance the ability to shrink, improve the contraction frequency, the mechanism of action: to promote the internal calcium synthesis of the uterus and secretion, so that calcium ions to the effective flow between the muscle cells. Calcium ions in muscle cells can interact with actin and myosin, enhance uterine contraction, and can produce good oppression effect on uterine wall blood vessels, and then play a role in promoting coagulation. However, clinical observation showed that some of the maternal tolerance to oxytocin is weak, the effect is not ideal when applied alone, and due to oxytocin in-vivo half-life is short, there is a need for repeated administration to maintain the effective concentration, and the effect of oxytocin is related with the number of oxytocin receptor, if the receptors are saturated, even if the increase in drug dose cannot cause uterine contractions. There were also studies had shown that the use of oxytocin alone to prevent postpartum hemorrhagic effect is less than combined medication.

Misoprostol is a derivative of pectin E1, can be converted into a bioactive compounds in the body, to promote uterine smooth muscle rhythmic contraction, thereby contraction of the uterus, play an effective role in hemostasis. And misoprostol inexpensive, can be vaginal, rectal, oral and other multi-way administration, absorption effect is good, the main side effect is gastrointestinal adverse reactions, such as diarrhea, nausea and vomiting, there are patients with chills, fever and other symptoms, but all adverse reactions are self-limiting, can be self-recovery. Misoprostol has the following application: can be used for the treatment when oxytocin ineffective in uterine atrophy symptoms, effectively promote uterine contraction; can produce expansion of vascular smooth muscle, there will be mild transient blood pressure reduction, hypertensive pregnant mothers are particularly suitable; full absorption, rapid onset, 30min can reach the peak, long half-life, 90min, and the duration of efficacy for the uterus contraction was significantly better than oxytocin. Misoprostol combined with oxytocin to prevent postpartum hemorrhage, allowing uterine contractions more quickly and longer duration. On the other hand, maternal uterine contractions, misoprostol can quickly produce softening effect on the cervix, induced contractions and placenta rapid stripping, contribute to placental delivery, and

effectively shorten the time of the third stage of labor. Misoprostol combined with oxytocin mechanism of action is: misoprostol can rapidly increase the concentration of prostaglandins in maternal, reduce the body's stimulation with oxytocin threshold, promote the pituitary secretion of endogenous oxytocin. When the two drugs are used at the same time, can quickly close the sinusoid, prevention of maternal postpartum hemorrhage, easy to use, cost-effective and high security.

Postpartum hemorrhage would cause changes in D-dimer and FIB levels, then there would have fibrinolytic system activation, D-dimer content was significantly increased, studies had shown that if pregnant women prenatal D-dimer level is at a high level then the probability of postpartum hemorrhage would be increased. At the same time, some researchers believed that the level of FIB was also associated with the occurrence of bleeding, if the maternal prenatal FIB content is low, often appeared postpartum hemorrhage.

The results of this study showed that there was no significant difference in serum calcium levels between the two groups ($P > 0.05$). The D-dimer in the observation group was lower than that in the control group and the FIB level was higher than that in the control group ($P < 0.05$). The second stage of labor in the observation group was also shorter than that in the control group ($P < 0.05$). After treatment, there was no significant difference between the two groups ($P > 0.05$). Proved that misoprostol combined with oxytocin to prevent postpartum hemorrhage clinical effect is good, high safety, worthy of clinical promotion.

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