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Intramuscular oxytocin administration before vs. after placental delivery for the prevention of postpartum hemorrhage: A randomized controlled prospective trial

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ABSTRACT

Objective: Postpartum hemorrhage is still the most significant cause of maternal mortality and morbidity worldwide. Our aim was to evaluate the effect of timing of oxytocin administration on postpartum hemorrhage incidence in parturients with low-risk for postpartum hemorrhage.

Study design: A randomized controlled trial was completed on 343 women at a level-three care hospital. In group 1, 10 IU of oxytocin was injected intramuscularly within the first minute following the delivery of the fetus. Group 2 received 10 IU of intramuscular oxytocin immediately following placental delivery. The primary outcome parameters were the incidence of postpartum hemorrhage and the measured blood loss.

Results: The rate of postpartum hemorrhage, defined as estimated blood loss >500 mL, did not differ significantly between the two groups (7/172 (4.1%) in group 1 vs. 10/171 (5.8%) in group 2, P = .45). The mean blood loss did not differ significantly between the two groups (192.18 ± 135.7 in group 1 vs. 198.92 ± 165.4 mL in group 2, P = .68). The duration of the third stage was significantly shorter in group 1. There were no significant differences between the two groups with respect to the mean changes in hemoglobin and hematocrit, postpartum 24th hour hemoglobin and hematocrit, the additional use of oxytocin, manual expulsion of placenta, curettage, blood transfusion demand, uterine atony, and lengthening of the third stage.

Conclusion: In a level-three care hospital, timing of intramuscular oxytocin administration did not influence the incidence of postpartum hemorrhage in women with low risk of postpartum hemorrhage.

Introduction

The third stage of labor is a period that starts with the birth of the fetus, and ends with the expulsion of the placenta and membranes. Postpartum hemorrhage, which complicates 0.5-1% of vaginal births, frequently occurs following this stage, and is still the most significant cause of maternal mortality and morbidity worldwide [1,2]. Proper management of the third stage of labor contributes to the prevention of postpartum hemorrhage. There are two main management styles at this stage, which are active management and physiologic management. The standard definition of active management includes the use of uterotogenic agents following birth of the fetus, early cord clamping/cutting, and controlled cord traction. In physiologic management, uterotogenic agents are not administered, late cord clamping and placental removal are performed with maternal effort. It has been reported that active management is associated with a 60% reduction in the incidence of postpartum hemorrhage compared with physiologic management [3].

Uterine atony is the most common cause of postpartum hemorrhage and constitutes 60–80% of these cases [4]. The most significant development in the prevention of atony emerged with the start of the use of uterotogenic agents. The discovery of ergot alkaloids in 1932, and the discovery of oxytocin in 1953 were among the most important developments in the history of modern science [5]. In a recent large-scaled randomized controlled study, it was defined that the most important component in the active management of the third stage of labor was the use of uterotogenic agents [6]. In a Cochrane meta-analysis, it was detected that oxytocin was superior to ergot alkaloids both in terms of efficacy and adverse effects [7]. The World Health Organization (WHO)

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recommends the use of oxytocin as the first-line uterotogenic agent in the prevention of postpartum hemorrhage [8].

In the present randomized controlled study, we evaluated whether the timing of oxytocin administration (being the most significant component of the active management of the third stage of labor) had an influence on the rate of postpartum hemorrhage in parturients with low risk for this outcome.

Material and methods

This randomized controlled prospective trial was conducted at Kanuni Sultan Suleyman Training and Research Hospital between January 2015 and December 2016, during which approximately 24,000 deliveries were made. The Local Ethics Committee approved the study (No:16434), and the ethics standards of the 1975 Declaration of Helsinki as revised in 2000 were followed.

Eligibility criteria were: absence of risk factors for postpartum hemorrhage; gestational age of 36–42 weeks, singleton pregnancy, live fetus, cephalic presentation, expected fetal birth weight of 2500–4500 g, maternal age <40 years, and parity (min-max) 0–5.

The exclusion criteria were: acute fetal distress, conversion to abdominal delivery during labor, need for labor augmentation, persistent high blood pressure (>140/90 mm Hg), placenta previa, ablatio placenta or uterine bleeding of any other cause encountered during pregnancy or labor, previous C-section, uterine scar, postpartum hemorrhage in previous pregnancies, hydramnios, symptoms of maternal infection, drug use in labor, abnormal placentation (accreta, increta or percreta), coagulation defects, forceps or vacuum extraction, hemoglobin concentration of < 8 g/dL; use of anticoagulants and tocolytics during pregnancy, multiple gestations, any known uterine malformations, and deep vaginal lacerations.

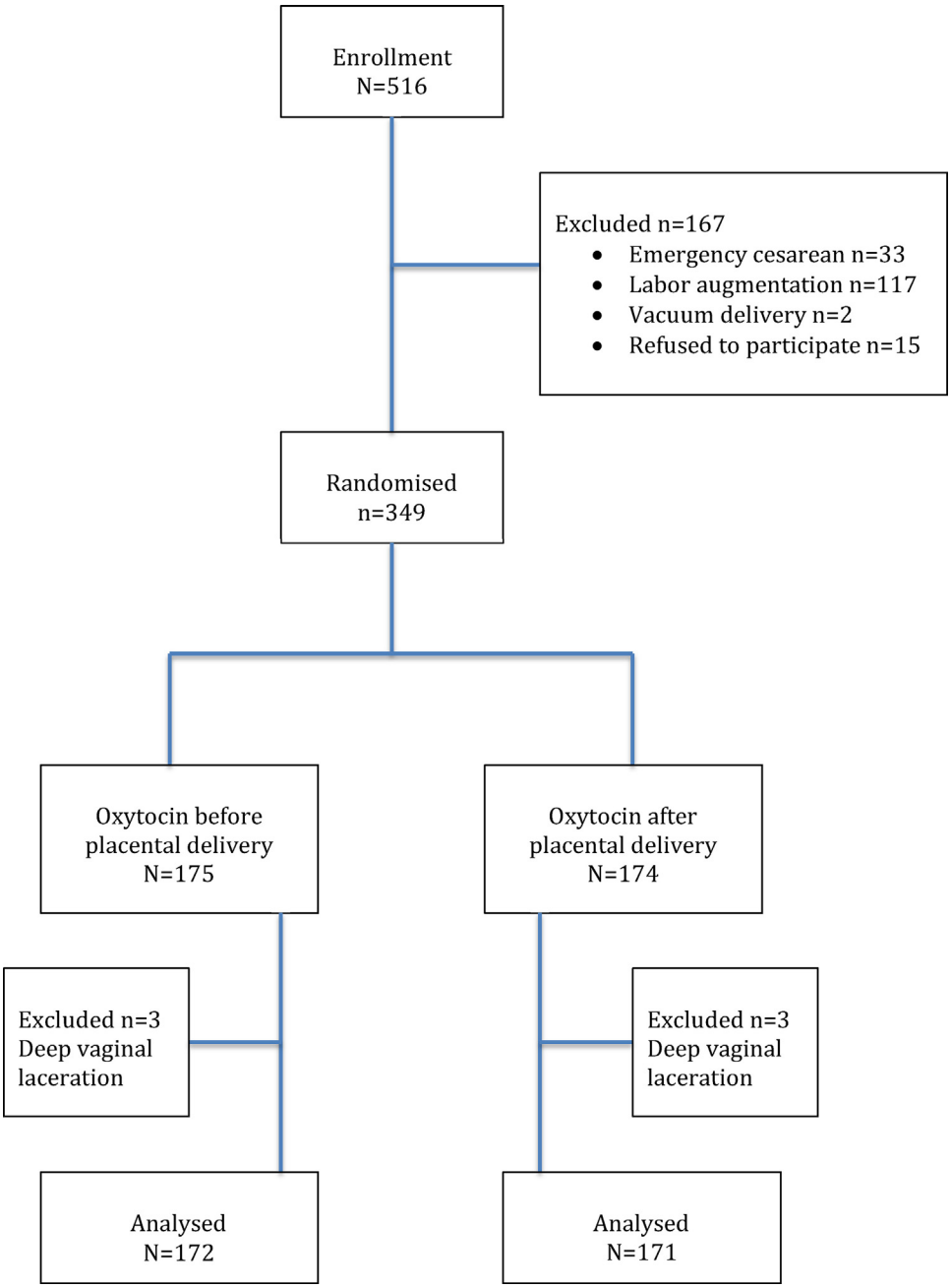

Fig. 1. Study flowchart.