



Risk Factors and Safety of External Cephalic Version in the Third Trimester of Breech Presentation Pregnancy

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KEYWORDS Breech Presentation. Pregnancy. Safety. Effect. Treatment. Assessment

ABSTRACT The aim of this study was to identify the risk factors and assess the efficacy and safety of external cephalic version (ECV) for women with breech presentation pregnancy in the third trimester. A total of 50 patients with breech presentation pregnancy admitted to the researchers' hospital from March 2018 to May 2019 were recruited in this clinical trial. All patients were treated with ECV. The success rate of ECV was calculated. In addition, the influencing factors of the ECV success were statistically analysed. The overall success rate of ECV achieved up to 80.0 percent. The influencing factors associated with successful and safe ECV consisted of the palpable foetal head and the descent of foetus into the pelvic cavity (both $P < 0.05$), whereas parity and placental position were not the risk factors of ECV success (both $P > 0.05$). For women with breech presentation pregnancy, it is feasible to apply ECV after comprehensive assessment of the pregnancy-associated risk factors.

INTRODUCTION

In obstetrics clinics, breech presentation is frequently encountered, which can lead to maternal and foetal harm (Hickok et al. 1992). Generally, in the third trimester of pregnancy, the foetus gradually changes to the foetal head position to facilitate a smooth delivery. The incidence rate of breech presentation pregnancy is estimated to be 3 percent to 4 percent, which is a common clinical foetal position abnormality (Hannah et al. 2000). When breech pregnancy is delivered through the vagina, complications, such as neonatal asphyxia and umbilical cord prolapse can be caused due to the posterior emergence of the foetal head. Therefore, breech pregnancy patients usually complete delivery by a caesarean section. Perinatal morbidity and mortality rates for vaginal breech delivery at term are significantly higher compared with those by vertex delivery (Hutton et al. 2002; Hofmeyr and Kulier 2005).

In the United States, approximately 15 percent of caesarean deliveries are accomplished for women presenting with breech presentation,

which is considered as the third most-frequent indication. This modern trend toward caesarean deliveries for breech presentation at term can increase the postsurgical maternal morbidity compared to vaginal delivery (Cho et al. 2012). Nevertheless, a caesarean delivery may also cause potential injury to the infant in breech.

After years of clinical experience by many experts, it is concluded that the use of external cephalic version (ECV) can convert foetal breech to the foetal head position in a certain probability without affecting pregnant women themselves (Royal College of Obstetricians and Gynaecologists 2006a). Therefore, ECV can be recommended for breech pregnancy women who have not obtained the indications of caesarean section. However, some scholars (Obeidat et al. 2011) believe that ECV can lead to the premature rupture of membranes of pregnant women, which is not conducive to foetal prognosis, and its clinical safety remains to be validated. The purpose of this paper is to evaluate the clinical effect and safety of ECV in the third trimester of breech presentation pregnancy.

Objective of the Study

The purpose of this study was to explore the risk factors and assess the efficacy and safety of external cephalic version (ECV) for women with breech presentation pregnancy in the third trimester.

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METHODOLOGY

Inclusion Criteria

The inclusion criteria for the study were that the uterine ultrasound examination showed that patients were diagnosed with breech presentation pregnancy, those in the third trimester of pregnancy, those with excellent health conditions, and those with singleton pregnancy. This study was approved by the Ethics Committee of the hospital and written informed consents were obtained from all patients and their family members.

Exclusion Criteria

The exclusion criteria were those who met the criteria of a caesarean section, those complicated with pregnancy-related diseases, such as pregnancy hypertension (eclampsia) and pregnancy-induced diabetes mellitus, etc., those with intrauterine foetal distress, and those with placental abruption.

ECV Procedures

All patients who were scheduled to undergo ECV received sufficient preoperative education related to the ECV and its consequences. At the same time, the patients' awareness of ECV was improved and the surgical endurance was also enhanced. Routine fasting before operation, establishment of venous access and preparation of rescue facilities and drugs were properly prepared. 30 minutes before ECV, use of tocolytic agent was delivered and foetal heart rate was closely monitored by cardiotocography for 30 minutes before ECV. All patients were instructed to evacuate stool and urine. The foetal position and placental location were determined under ultrasound examination. All patients lay in the supine position. The pivot point of the foetal bottom was identified, the foetus was turned and pressed out of the pelvis towards one side. The surgeon held the foetal bottom with one hand and pressed the foetus to the uterine fundus with an appropriate amount of pressure, and held the foetal head with the other hand to slowly move towards the pelvic position. Intraoperatively, the changes of foetal heart rate were closely monitored. After the operation, use of tocolytic agent was terminated and

the foetal heart rate was persistently monitored. The success rate of ECV was calculated and the risk factors of ECV were also identified.

Statistical Analysis

SPSS 22.0 statistical software was utilised for all data analyses. The data were expressed in percentage and proportion, and statistically analysed by chi-square test. The risk factors of ECV success rate were explored by univariate logistic regression analysis. A *P* value of less than 0.05 was considered as statistical significance.

RESULTS

Baseline Data

Fifty patients with breech presentation pregnancy admitted to the hospital from March 2018 to May 2019 were recruited in this clinical investigation. All enrolled patients were aged from 22 to 40 years old, with an average age of (32.00±1.34) years old. The gestational weeks ranged from 34+2 to 39 weeks, (37.00 ±1.03) weeks on average. Among them, there were 30 nulliparous women and 20 multiparous women.

Success Rate of ECV

Among the 50 enrolled women, 40 patients successfully completed the ECV. The overall success rate of ECV achieved was up to 80.0 percent. In the nulliparous women, the success rate of ECV was 85.0 percent and 76.7 percent in their multiparous counterparts. In women with placental location on the anterior uterine wall, the success rate of ECV was calculated as 65.2 percent and 81.5 percent for those with placental location on the posterior uterine wall. For women with a palpable foetal head, the success rate of ECV achieved was up to 85.7 percent and 33.3 percent for those with a nonpalpable foetal head. For patients with descent of the foetus into the pelvic cavity, the success rate was 37.5 percent and 71.4 percent for those without descent of the foetus into the pelvic cavity, as illustrated in Table 1. This shows that the influencing factors associated with successful and safe ECV consisted of the palpable foetal head and the descent of the foetus into the pelvic cavity.

Table 1: Risk factors associated with success rate of ECV

Variables		Number of cases (n)	Success cases (n)	P value
Parity	Nulliparity	20	17	>0.05
	Multiparity	30	23	
Placental Position	Anterior uterine wall	23	15	>0.05
	Posterior uterine wall	27	22	
Foetal Head	Palpable	35*	30*	<0.05
	Nonpalpable	15	5	
Descent of Foetus into Pelvic Cavity	Descent	8*	3*	<0.05
	Non-descent	42	30	

Note: * $P < 0.05$

Risk Factors of ECV

Of the few variables explored, nulliparity and placental location were not the variables that were associated with the success rate of ECV. Nevertheless, the success rates of ECV significantly differed between women with a palpable foetal head and a nonpalpable foetal head, and between those with and without descent of the foetus into the pelvic cavity (both $P < 0.05$), indicating that palpable foetal head and the descent of the foetus into the pelvic cavity were the risk factors correlated with the success rate of ECV.

DISCUSSION

At present, ECV is still regarded as a useful approach to lower the caesarean section rate in women with singleton breech presentation pregnancy, whereas it has not been considered as a routine procedure by obstetricians in clinical practice since the obstetricians should be capable of turning the breech foetus to the cephalic presentation with a smooth vaginal delivery (Kok et al. 2008). Both the mother and the foetus should be safe throughout the process of ECV, which largely relies upon the obstetrician's knowledge and experience (Benmeir et al. 2008).

According to the guidelines published by the Royal College of Obstetricians and Gynecologists (RCOG) and the American College of Obstetricians and Gynaecologists (ACOG) (Royal College of Obstetricians and Gynaecologists 2006b; American College of Obstetrics and Gynecology (ACOG) 2000), it is believed that after a gestational age of 37 weeks, ECV can be recommended for women with singleton breech presentation pregnancy,

which can restore the normal foetal position and reduce the caesarean section rate.

In this clinical investigation, 50 cases of breech presentation pregnancy were treated by ECV, and the success rate of ECV was calculated as 80.0 percent (40/50). In the remaining 10 cases of unsuccessful ECV, the following causes may be responsible for ECV failure. During the process of ECV, the patients could not tolerate the intense pain due to abdominal wall muscle tension, and then the ECV was terminated. Several patients who could endure abdominal wall muscle tension and pain failed to successfully receive ECV. Other patients suffered from uterine contraction, exposure to the pelvic cavity and foetal heart slowdown during the ECV and the surgery was terminated after comprehensive evaluation. Therefore, a detailed analysis was conducted of the risk factors related to the success of ECV for breech presentation pregnancy, and found that the success of ECV was directly correlated with the possibility of palpable foetal head and the descent of foetus into the pelvic cavity. However, maternal parity was not a risk factor of the success of ECV, which was inconsistent with previous findings (Hutton et al. 2011; Goetzinger et al. 2011; Bogner et al. 2013; Kabiri et al. 2011), probably due to the small sample size in the present study. Therefore, the findings indicate that ECV is feasible for patients with breech presentation pregnancy. During the operation, extensive attention should be paid to the palpable foetal head and descent of the foetus into the pelvic cavity, which can significantly ensure the safety of ECV.

The outcomes in this investigation suggest the feasibility and safety of ECV, whereas ECV

indeed led to intense pain in a majority of cases. Previous studies (Clock et al. 2009; Chan et al. 2004; Kuppens et al. 2012) have reported that the score of pain severity caused by ECV can reach 5.7 points, which is likely to cause discomfort and pain for most pregnant women. However, local anaesthesia is still not considered as a routine procedure in ECV to avoid affecting the normal blood supply or causing adverse events to the foetus. Some scholars (Abenhaim et al. 2009; Higgins et al. 2013) believe that the sedation drugs can be applied to partial patients with severe abdominal pain to promote the relaxation of abdominal muscles and increase the success rate of ECV.

For 10 patients who failed to complete ECV in this study, they were scheduled to undergo caesarean delivery at an elective time, and then attempted to undergo ECV under anaesthesia. If the operation was successful, vaginal delivery was attempted. Patients who failed the ECV were scheduled to receive a caesarean section as planned.

CONCLUSION

It is safe and feasible to apply ECV for women with breech presentation pregnancy. Prior to ECV, preoperative preparation and necessary examinations should be accomplished, and the eligible cases should be screened out. Whether the foetal head is palpable and the descent of the foetus into the pelvic cavity should be intimately observed, intraoperatively, the foetal heart rate should be closely monitored and the chief complaints of the women should be considered. Besides, the abdominal wall tension should be actively and effectively managed.

RECOMMENDATIONS

During ECV procedures, extensive attention should be paid to the foetal head position and presentation. Effective measures should be delivered to improve the maternal muscle tension and guarantee the safety of ECV.

ABBREVIATIONS LISTS

ECV: External Cephalic Version
 RCOG: Royal College of Obstetricians and Gynaecologists
 ACOG: American College of Obstetricians and Gynaecologists

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest to report regarding the present study.

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