External cephalic version at term using broad criteria: effect on mode of delivery

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Summary: We sought to determine whether external cephalic version (ECV) with tocolytic agents in term patients with breech presentation could safely reduce the incidence of breech-related cesarean sections and vaginal breech deliveries. Four hundred and thirty-two patients with breech presentation at term who fulfilled broad criteria for attempted ECV and a control group of 330 patients with breech presentation at term in whom ECV was not attempted, were retrospectively reviewed. ECV was attempted following an infusion of ritodrine hydrochloride, using either the back flip of Saling and Muller-Holve or the classic forward roll. Following successful ECV, an infusion of oxytocin was administered to fix the head in the pelvis.

Of the 432 patients, 311 (72%) underwent successful ECV; 86% delivered vaginally. Cesarean sections were performed in 76% of the patients with unsuccessful ECV and in 64% in whom the version was not attempted (control group).

We conclude that ECV at term, using tocolytic agents, when applied to a broad spectrum of patients, is a safe and useful procedure for reducing the incidence of breech presentation, and as a direct consequence, for reducing the incidence of cesarean sections.

Key words: External cephalic version; Breech; Term pregnancy.

INTRODUCTION

Over the past twenty years the incidence of cesarean sections (C/S) has significantly increased in the United States ([1]), Canada ([2]) and Australia ([3]), and committees have been established worldwide to deal with this phenomenon ([4-6]). One of the most important factors contributing to this increase is the growing use of C/S for breech presentation.

Breech presentation is found in 3-5% of all labors, with up to 60% of these babies delivered by C/S ([7]); thus, breech presentation accounts for 2% of all cesarean sections. Morgan and Kane ([8]) studied the outcome of more than 16,000 babies with breech presentation delivered vaginally and showed that perinatal mortality and morbidity is fivefold higher than for babies with vertex presentation. Moreover, breech babies delivered vaginally show a high incidence of neurological damage ([9, 10]). As shown in Table 1 several recent studies ([11-21]) have indicated

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Table 1. — *Effect of external cephalic version at term on the incidence of cesarean section in reported series.*

Author	No. of patients	Success No. (%)	C/S (%)	Failure C/S (%)	No. of controls	Control C/S (%)	Control: Spont. Vers. (%)
Van Dorsten *et al.* [11]	25	17 (68)	1 (6)	6 (75)	23	17 (74)	4 (17)
Hofmeyer [12]	30	29 (97)			30	13 (43)	10 (33)
Ferguson and Dyson [13]	15	11 (73)	1 (9)	4 (100)			
Stine *et al.* [14]	148	108 (73)	24 (24)	33 (83)	23	17 (74)	4 (17)
Rabinovici *et al.* [15]	58	39 (67)	3 (8)	11 (58)			
Hofmeyer *et al.* [16]	80	62 (78)	10 (16)	14 (78)	108	62 (57)	39 (36)
Dyson *et al.* [17]	158	122 (77)	50 (32)	33 (92)	40	32 (80)	5 (12)
Morrison *et al.* [18]	304	207 (68)	25 (12)	60 (62)			
Flanagan *et al.* [19]	171	83 (48)	9 (11)				
Marchick [20]	65	39 (60)	9 (23)	26 (100)			
Mahomed *et al.* [21]	103	89 (86)					

that external cephalic version (ECV) with the use of tocolytic agents is highly successful. As part of our effort to reduce safely the incidence of cesarean sections and, at the same time, the incidence of vaginal delivery of breech babies, with the inherent risks and complications, we evaluated a group of pregnant women at term with breech presentation in whom we attempted ECV, and compared the results with those in a control group in whom we did not attempt ECV. The indications for ECV in this study were broader than those used in other reported studies [11-22]. We also evaluated several other relevant factors: parity, gestational age, placental site; fetal weight and type of breech.

MATERIALS AND METHODS

From January 1985 to October 1990 ECV was attempted in 432 patients with breech presentation at term after informed consent had been obtained. The control group consisted of 330 patients with breech presentation at term who did not attend the High-Risk Pregnancy (HRP) clinic and in whom ECV nas not attempted. The criteria for inclusion in the study were: 1, gestational age more than 37 weeks; 2, breech presentation; 3, absence of any of the absolute contraindications (multifetal gestation, prepartum hemorrhage, placenta previa, premature rupture of membranes, major fetal malformations); 4, normal sonographic appearance of fetus, placenta and amniotic fluid volume; 5, a reactive nonstress test; 6, normal maternal ECG; 7, anti-D injection to Rh(−) women; 8, normal pelvis. The absence of any other indication for C/S, and absence of relative contraindications (state after C/S, hypertension, intrauterine growth retardation, obesity and anterior placenta) were dealt with individually according to clinical judgment. All patients in the control group qualified for ECV according to our criteria.

The procedure was conducted in the HRP clinic. ECV was carried out in the morning with the patient in a fasting state for at least 6 hours. An intravenous line with normal saline was inserted. A nonstress test was performed, and once a reactive pattern was noted, ritodrine hydrochloride was infused at 0.1 mg/min for 15 min prior to and during the procedure. Maternal heart rate and blood pressure were continuously monitored, as was fetal heart rate. Patients were placed in the supine position with left lateral displacement of the uterus. The type of version used was based on the location of the fetal head. When the fetal spine and head were on the same side of the maternal midline, the back flip of Saling and Muller-Holve [23] was attempted; when the fetal head and spine were on opposite sides of the midline, the classic roll was attempted. The procedure was interrupted if discomfort became intolerable to the patient or if fetal heart rate decelerations were noted. Only one attempt was performed per patient.

Once the fetus was turned and the position was confirmed by ultrasonographic examination, the tocolysis was discontinued, and an infusion of oxytocin 0.5 mg/min was started to fix the fetal head in its new position. After 3 hours, the non-stress test was repeated. If the result was normal, the patient was sent home and reexamined after three days to confirm the presentation.

Statistical differences between the study and control group were established by chi-square analysis.

Table 2. — *Results of external cephalic version.*

	Study Group (N=432) (%)		Control Group (N=330) (%)
	Successful	*Unsuccessful*	
	311 (72)	121 (28)	
Presentation at labour			
Vertex.	295 (95)	3 (2)	54 (16)
Transverse	6 (2)		
Breech	10 (3)	118 (98)	276 (84)

RESULTS

There were no perinatal deaths. In several cases, transient fetal bradycardia with rapid recovery was noted, but no case of persistent bradycardia was recorded.

The version was initially successful in 311 of the 432 cases (72%). Follow-up data were available for all (Table 2). Two-hundred and ninety-five of the successfully turned infants (95%) remained vertex, and 3 (2%) of the unsuccessful cases subsequently became vertex spontaneously. Of the control group, only 54 (16%) converted spontaneously to vertex. Sixteen successfully turned fetuses reverted to abnormal presentations: 10 (3%) breech and 6 (2%) transverse lie. Eighty-six percent of the successful version patients and 24% of the unsuccessful version patients underwent C/S as compared to 64% of the control group ($p < 0.001$) (Table 3).

Tables 4 and 5 summarize the relationship of several determinants such as parity, gestational age, placental site, fetal weight and type of breech, and the success of ECV on the outcome of delivery.

DISCUSSION

The present study demonstrates that use of liberal selection criteria for ECV performed in late pregnancy under tocolysis followed immediately by oxytocin in successful cases, reduces both the incidence of breech presentation at delivery (84% compared to 30% for controls) and the rate of cesarean sections (33% and 65%, respectively).

ECV is performed after the 37th week of gestation, because at that point the rate of pathological presentations stabilizes at about 4%, whereas during the second and early third trimester, almost any fetal position can be considered normal ([23]).

When we compared the study period (1985-1990) with the period before ECV was performed regularly (1980, 1983, 1984) a reduction in the rate of breech presentations at delivery was noted (from 4 to 3.5%) in the total population of parturient patients. Although this difference is not statistically significant, a downward trend is apparent. The major disadvantage of antepartum ECV is the risk of the procedure itself.

However although the safety of the procedure has been questioned in the past, all recent studies of external version using the safeguard recommended by Saling and Muller-Holve ([23]) have shown, on average, a low complication rate ([11, 23, 26]). In our patients ECV under tocolysis was well-tolerated, and minimal morbidity was documented. The only adverse effect was one case of transient fetal bradycardia during the manoeuvre. There was no need for emergency delivery or induction of labour as a result of the procedure.

Table 3. — *Success rate of external cephalic version in study group and effect on mode of delivery.*

	Study Group (N=432)	*Mode of Delivery* C/S	Vaginal
Success		45 (14%)	266 (86%)
Initial Success	311 (72%) of total group		
Version Maintained	295 (95%) of successes		
Reversion	16 (5%) of successes		
Failure		92 (76%)	29 (24%)
Initial failure	121 (28%) of total group*		
Spontaneous Version	3 (2%) of failures		

* Control group (N=331) had only 54 (16%) spontaneous versions. In all, 32% of the study group underwent C/S compared with 64% of controls. ($p < 0.001$).

Table 4. — *Influence of related variables on success of external cephalic version.*

Variables	No. of patients	No. of successful versions (%)	Chi square	Significance (p)
Parity				
Primipara	164	67 (41)	50.4	< 0.001
Multipara	268	201 (75)		
Gestational age (wks)				
37-39	268	163 (61)	10.1	< 0.01
> 40	164	74 (45)		
Placental site				
Anterior	104	45 (43)	6/0	< 0.05
Other	328	187 (57)		
Fetal weight				
< 3500 gr	328	164 (50)	6.7	< 0.01
> 3500 gr	104	37 (36)		
Type of breech				
Frank	199	82 (41)	24.4	< 0.001
Complete	142	97 (68)		
Frank	199	82 (41)	7.3	< 0.01
Incomplete	91	53 (58)		
Frank	199	82 (41)	2.45	N.S.
Complete	142	97 (68)		

Table 5. — *Influence of external cephalic version on the outcome of delivery.*

Delivery outcome	Study group N = 432 (%)	Control group N = 330 (%)	Significance
Apgar 1′<7	144 (33)	121 (37)	N.S.
Apgar 5′<7	12 (3)	13 (4)	N.S.
Meconium	62 (14)	16 (5)	N.S.

We found no significant difference between failure and success of ECV with regard to the type of breech presentation, although differences with regard to parity, gestational age, placental site and fetal weight were noted. This is in contrast to the findings of Rabinovici *et al.* ([15]). Although many Authors refer to the high spontaneous version rate from breech to vertex, which is assumed to occur near term, the true rate of spontaneous version after 37 week's gestation has been poorly studied. The only previous works confirming fetal positions by ultrasound reported spontaneous conversion rates of 17% and 12% ([11, 16]). In the present study a spontaneous conversion rate of 16% was observed. On the other hand, only three patients of those in whom attempted version failed were subsequently found to have vertex presentations.

In contrast to almost all the studies on this subject which recommend careful selection of low-risk patients ([11, 15, 17]), we used more liberal criteria. For example, the state after C/S was not absolute contraindication. Nevertheless, we did not have a higher complication rate, thereby demonstrating the potential application of this technique to a wider population.

Based on our experience we believe that ECV at term with the hse of a toolytic agent, when applied to a broad spectrum of patients, is a clinically useful procedure for reducing the incidence of breech presentation at term and, as a direct consequence, reducing the indicence of C/S.

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