

Effect of Learning Curve on the Outcome of External Cephalic Version

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ABSTRACT

Aim: The aim of this study was to find out the effect of learning curve on the outcome of external cephalic version (ECV) at term, using tocolytics. The effect of various factors affecting the outcome of ECV was also studied in relation to the learning curve.

Methods: This is a prospective longitudinal observational study of 80 consecutive cases of ECV. They were analysed in relation to outcome, parity, type of breech, placental site and birth weight. The cases were divided consecutively into 4 groups of 20 cases each, in order to analyse the effect of learning curve.

Results: The learning curve for ECV is very sharp. The success rate of external cephalic version plateau after the first 20 cases from 45% to about 60%. Only parity and type of breech have a significant effect on the outcome. The success rate is lower for primipara and non-flexed breech. This negative effect is strongest in the first 20 cases and again plateaus after the first 20 cases. The high success rate of multipara and primipara flexed breech is obtained even in the first 20 cases and does not improve with further experience.

Conclusions: The learning curve for ECV is sharp and plateaus after the first 20 cases. Outcome of ECV for patients with favourable factors such as multiparity and flexed breech is not affected by learning curve.

Keywords: external cephalic version, learning curve, experience

INTRODUCTION

External cephalic version (ECV) at term is now an accepted and recommended mode of management for breech presentation⁽¹⁻³⁾. Most studies on the outcome of ECV are carried out by obstetricians with prior experience in ECV. As a result, the effect of learning curve on the outcome of ECV is seldom studied. Many obstetric units are now just reintroducing ECV to their routine practice as it was out of favour in the 1980's. This study may act as a guide to obstetricians embarking on the procedure for the first time with regard to the possible expected outcome in relation to their learning curve. The effect of various factors on the outcome is also studied in relation to the learning curve.

METHOD

This is a prospective observational longitudinal study on the effect of learning curve on the outcome of ECV. All the 80 consecutive cases of ECV were carried out by the author from April 1994 to June 1996. The author had only very limited experience (3 cases) with preterm external cephalic version without tocolytics prior to the study.

All the ECV's were carried out after 37 weeks of gestation in the labour ward with terbutaline infusion. The dosage was 2.5 mg of terbutaline in 500 mLs of dextrose 5%, infused at a rate of 1.5 mL/min for 30 minutes. This gives a total dose of 225 µg of terbutaline. This is a modification of our labour ward terbutaline regime for preterm labour.

An ultrasound examination was carried out for all patients prior to the procedure to exclude any contraindications as well as confirm the breech presentation. All the patients had a non-stress cardiotocograph before and after the procedure. All the ECV were conducted in the labour ward. The patients were all fasted on the day of the procedure. Blood was also taken for haemoglobin level and crossmatched in case of the need for emergency Caesarean section.

Each ECV attempt was limited to 5 minutes and the fetal heart rate was auscultated every 2 minutes. A maximum of 3 attempts were allowed.

Technique

The technique of ECV employed involves using the forward roll as far as possible⁽⁴⁾. The contraindications to ECV for this study is as shown in Table I.

The bed is tilted 20° in the head down position. The procedure is carried out after 30 minutes of terbutaline infusion. The operator stands on the side of the patient in the direction of version of the fetal head. The breech is first disengaged by gentle pressure on both sides of the presenting part with the palm of the hand. The poles are grasped with the fingers and turned gently with finger movements. Care is taken not to release the fetal poles at any time during the procedure. A short pause during each attempt allows for auscultation of the fetal heart as well as for the fetus to adjust its posture which may facilitate the procedure.

At the end of the attempts, the patient is sat up and the terbutaline infusion stopped. A post ECV cardiotocograph recording is carried out and the

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Table I - Contraindications to ECV in this study

I.	When vaginal delivery is contraindicated eg
	1. Uterine scar integrity suspected - 2 previous LSCS, Classical Caesarean
	2. Placental praevia
	3. Contracted pelvis
II.	When the risk of ECV is increased eg.
	1. Severe pre-eclampsia
	2. IUGR
	3. Antepartum haemorrhage
III.	When ECV is unlikely to succeed eg.
	1. Oligohydramnios
	2. Uterine abnormality
	3. Twins

ECV : external cephalic version
LSCS : lower segment caesarean section
IUGR : intrauterine growth retardation

Table II - Overall outcome of 80 cases of external cephalic version

Successful ECV	45 (56%)	Primipara : 24 (44%)
		Multipara : 21 (84%)
Failed ECV	35 (44%)	Primipara : 31 (56%)
		Multipara : 4 (16%)

ECV : external cephalic version

Table III - Outcome of ECV according to groups

	Successful ECV	Failed ECV
Group A (case 1-20)	9 (45%)	11 (55%)
Group B (case 21-40)	12 (60%)	8 (40%)
Group C (case 41-60)	11 (55%)	9 (45%)
Group D (case 61-80)	13 (65%)	7 (35%)
Total	45 (56%)	35 (44%)

patient is discharged after 2 hours of observation. The patient is also advised to keep a fetal kick chart.

RESULTS

The outcome of the 80 cases of ECV is shown in Table II. The overall success is 56%. ECV was successful in 44% of primipara and 84% of multipara.

The 80 consecutive cases of ECV were divided into group A (patient no. 1 to 20), group B (patient no. 21 to 40), group C (patient no. 41 to 60) and group D (patient no. 61 to 80). They were then analysed in relation to the groups to ascertain the effect of learning curve.

The outcome of group A, B, C and D are shown in Table III. There was an improvement in success of ECV after the first 20 cases which plateaus after that. The success rate for group A was 45% (9/20) compared to 60% (12/20) for group B, 55% (11/20) for group C and 65% (13/20) for group D. However, this could not be shown to be statistically significant in view of the small numbers within each group.

Parity has a statistically significant effect on the outcome. The overall success rate for primipara is 44% compared to 84% for multipara which is statistically significant ($p < 0.01$). The success rate for primipara in group A was 33% (5/10), group B was 50% (7/14), group C was 46% (6/13) and group D was 46% (6/13). There is an improvement in the outcome of ECV for primipara from group A when compared with the other groups (Table IV). This was however, not statistically significant.

A good outcome of 80% (4/5) success rate for ECV for multiparas is obtained even in the first 20 cases of ECV. This remains more or less the same and does not change significantly with increasing experience (Table IV).

Flexed breech was found to improve the success rate of ECV significantly compared to non-flexed breech ($p < 0.01$). The overall success rate for flexed breech is 73% (29/40) versus 40% (16/40) for non-flexed breech (ie. extended breech and footling breech). Further analysis of the effect of type of breech on the outcome of ECV was confined to primipara so as to remove the strong positive influence of multiparity. There was no change in the outcome of ECV for primipara with flexed breech as shown in Table V. There is a marked improvement in the outcome of ECV for primipara with non-flexed breech with increasing experience (Table V). This was however, not statistically significant and the increase was also not consistent as shown by the outcome in group B.

Birth weights and placental sites have been shown not to affect the outcome. Hence, they were not analysed in this study. There were 4 cases of transient fetal bradycardia, none of which needed any intervention.

DISCUSSION

Some authors have suggested that the success of ECV is not dependent on experience^(5,6). This opinion is not shared by many others⁽⁷⁾. The effect of the learning curve on the outcome of external cephalic version (ECV) is extremely difficult to study. This is because most of the studies on ECV are carried out by obstetricians with some experience in ECV. To study the effect of the learning curve, one will need to document the cases at the start of the learning curve. The effect of the learning curve may not be statistically significant due to the small number of cases within each group of analysis. Increasing the number within each group (eg. from 20 cases to 40 cases) with the hope of obtaining statistically significant results may not be practical. Most obstetricians with 40 cases of ECV can be considered sufficiently proficient in the art. We need a smaller number to act as a guide and check on the progress in our learning experience. A study which compares the outcome of ECV between experts and beginners is also not satisfactory. This will not give a guide to the changing effect of the learning curve. An ideal study would involve a large number of longitudinal prospective observational studies on the outcome of

Table IV - Successful ECV according to the groups

	Primiparas	Multiparas	Total
Group A	33% (5/10)	80% (4/5)	45% (9/29)
Group B	50% (7/14)	83% (5/6)	60% (12/20)
Group C	46% (6/13)	71% (5/7)	55% (11/20)
Group D	46% (6/13)	100% (7/7)	65% (13/20)
Total	44% (24/55)	84% (21/25)	56% (45/80)

Table V - Successful primipara ECV according to groups and type of breech

	Primipara Flexed breech	Primipara non-flexed breech	Total
Group A	57% (4/7)	12% (1/8)	33% (5/15)
Group B	60% (3/5)	44% (4/9)	50% (7/14)
Group C	62% (5/8)	20% (1/5)	46% (6/13)
Group D	67% (4/6)	29% (2/7)	46% (6/13)
Total	61% (16/26)	28% (8/29)	44% (24/55)

ECV by obstetricians embarking on the procedure for the first time. The above study is based on the experience of a single operator and as such, the shortcomings of the study should be kept in mind. However, the aim of this study is to act as a guide to ECV during the learning process.

The overall success rate for ECV in this study is similar to the general quoted rate⁽⁸⁻¹⁰⁾. The overall success rate of ECV improved after the first 20 cases and subsequently plateaus off. This shows that the learning curve is quite sharp. There was no improvement in the success rate with further increase in experience. While this is a disappointment to the author, this result is very encouraging for beginners. A beginner in ECV can expect to reach fairly competent level after the first 20 cases of ECV, based on this study.

Parity and type of breech have a significant effect on the outcome of ECV^(11,12). Multiparity and flexed breech improve the success rate of ECV. The better success rates of ECV for multiparas and flexed breech is obtained even in the first 20 cases of ECV. The success rate of multiparas is 80% in the first 20 cases. These are the types of patients ideal for beginners, so that they can gain confidence as well as good outcome for the patients. The success rate for primiparas with flexed breech remains at about 60% regardless of experience.

The success rate for primiparas is significantly lower than multiparas^(4,11). The success rate does improve when the second 20 cases of ECV (50%) is analysed against the first 20 cases of ECV (33%). However, there was no further improvement with increasing experience. The difference in success rate is not statistically significant in view of the small numbers within each group.

The effect of type of breech on the outcome of ECV in relation to learning curve was confined only to primiparas. This is because the extremely good outcome of multiparas will mask whatever possible effect of the learning curve on the effect of the type of breech. Primiparas with flexed breech have a success rate of 57% in the first 20 cases of ECV and improves marginally to 66% in the last 20 cases. The success rate of primiparas with extended breech was only 12% in the first 20 cases. However, it improved to 29% in the last 20 cases. This improvement was however not consistent with the second 20 cases having an extremely good outcome of 44%. We can therefore assume that the improvement in outcome for this group occurs by the second 20 cases.

The placental sites and birth weights were not found to have a significant effect on the overall success rate of ECV. Therefore their effects were not studied in relation to the learning curve. Other factors such as station, cervical dilatation and position of the fetal spine were not looked into in this study. The benefits of tocolysis have been shown to decrease with increasing experience⁽¹⁰⁾. This was also not looked into in this study.

While this study is based on the experience of a single obstetrician and the effects were not statistically significant, it can be a useful guide to obstetricians learning ECV for the first time.

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