West Middlesex University Hospital

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Date of Search:30 Aug 2017
Sources Searched: Medline, Embase, PubMed.

External Cephalic Version (ECV)

See full search strategy

1. External Cephalic Version and Reducing the Incidence of Term Breech Presentation: Green-top Guideline No. 20a

Author(s): anonymous

Source: BJOG: An International Journal of Obstetrics and Gynaecology; Jun 2017; vol. 124 (no. 7)

Publication Date: Jun 2017

Publication Type(s): Article

Available in full text at BJOG: An International Journal of Obstetrics and Gynaecology - from John Wiley and Sons

Database: EMBASE

2. External cephalic version (ECV) is an effective intervention to reduce caesarean sections; see how we do this at the Royal Hampshire County hospital, Winchester, Hampshire, UK

Author(s): Fayyaz M.; Heard M.

Source: BJOG: An International Journal of Obstetrics and Gynaecology; Jun 2016; vol. 123 ; p. 165

Publication Date: Jun 2016

Publication Type(s): Conference Abstract

Available in full text at BJOG: An International Journal of Obstetrics and Gynaecology - from John Wiley and Sons

Abstract: Introduction External cephalic version is the manipulation of the foetus through the maternal abdomen to cephalic presentation, 3- 4% of babies present as breech at term. Caesarean section (CS) is considered to be the safest mode of delivery for breech presentation at term. CS has a higher risk of maternal mortality and morbidity compared to vaginal delivery. Breech presentation is the primary indication for 10% of all CSs in the UK which means approximately 16,608 caesareans were performed for breech presentation in the NHS from 2013 to 14. The evidence from randomised trials shows that attempting ECV at term increases the chance of vaginal cephalic birth and reduces the chance of a CS and vaginal breech delivery. All women who have an uncomplicated singleton breech pregnancy at 36 weeks gestation should be offered an ECV. Best success rate quoted in literature is 50%. Method We did a three year prospective review of ECV at RHCH, Winchester. Data are regularly collected for all ECVs performed in our unit for audit using a standardised form. Results A Total of 172 women had ECV performed from January 2013 to December 2015, 88 (52%) had successful ECV without any complication. We also offer ECV after one previous LSCS. 71 (41%) of

Women were multipara, success rate for this group was 73% (52). After successful ECV 42 (81%) multipara achieved vaginal delivery, 7(13%) required emergency LSCS and 2 (0.3%) had elective LSCS for unstable lie. 88 (79%) women were primigravida, where success rate was lower 37% (37). 25 (68%) had vaginal delivery and 11 (30%) EmLSCS. Analysis of success rate by gestational age showed most (83%) of the successful ECVs in multipara were at 36-38 weeks and in primigravida (81%) 36-37 weeks. 95% of ECVs were performed by one senior Obstetrician and in 45% of ECVs speciality trainees were given the opportunity of experience. Tocolysis was used in approximately 30% of cases. All women with Rh negative blood group received anti D. BMI range was 20- 40, and duration of the procedure ranged 2-35 min. All procedures were performed using ultrasound guidance and electronic foetal monitoring was used to assess foetal wellbeing. Conclusion A well-established ECV service is an important step towards reducing CSs. We have an exemplary ECV service which is compliant with the national standards. Our success rate is best in our region and we provide good training opportunities. We are happy to support our neighbouring units.

Database: EMBASE

3. Ultrasound-guided external cephalic version, a modern approach to an old technique

Author(s): Maraver V.M.P.; Millan V.S.; Becerra A.G.; Garcia Garcia J.A.; Pajuelo S.M.

Source: Journal of Perinatal Medicine; Jun 2013; vol. 41

Publication Date: Jun 2013

Publication Type(s): Conference Abstract

Abstract: An increasing number of cesarean sections in our environment, means economic costs and complications also increase. Breech presentation (3-4% fetuses at term) is a leading indication for cesarean delivery, and Ultrasound-guided External Cephalic Version (UECV) is a technique sometimes able to turn those breech fetuses from buttocks or foot first to head first in a safe way. Goals are not only to reduce the cesarean section rate, but also the fetal mortality and complications associated with it, and the associated economic costs. The procedure of ultrasoundguided external cephalic version is simple and entails little risk if inclusion and exclusion criteria are followed: - Inclusion criteria: Fetus between week 36 and 41 of gestation confirmed by ultrasound to be in non-cephalic presentation. ASA I-II pregnant women Informed consent form signed by the patient. - Exclusion criteria: Multiple gestation Amniorrhexis Fetal abnormalities Premature abruption of normally inserted placenta Severe hypertension Allergy to any drug or material used in the procedure Amniotic fluid index < 8 cm Abnormal nonstress test (NST) Contraindications for vaginal delivery Abnormalities of the uterus and clotting disorders Placenta praevia Rh sensitization Coagulopathy History of substance abuse Heart or cerebrovascular disease When we detect a breech baby pregnancy in the third trimester ultrasound (34 weeks), we schedule a second check after two weeks. Then, if fetus is still in non-cephalic presentation, we offer an UECV. The attempt is made around 36 to 37 weeks (that is far enough along to do an emergency cesarean if needed) and we have a 35-40% success rate. First, we perform a nonstress test (NST) during an hour to confirm fetal well-being. Three stages can be identified during the UECV: moving the foetus up away from the mother's pelvic bones, whole rotation and bringing the head down again into the pelvis. Every stage is done under ultrasound control, to ensure fetus safety and absence of complications. Uncommon risks can include fetal distress requiring an emergency cesarean, precipitation of labor or ruptured membranes abruptio placentae, fetomaternal hemorrhage (0-5%), and cord entanglement (<1.5%). A more common risk of cephalic version is transient slowing of the fetal heart rate (in as many as 40% of cases). Following the UECV attempt, whether successful or not, we repeat the nonstress test again for 45 minutes prior to discharge, to ensure fetal well-being after the technique. If the baby is now in a cephalic presentation, we set an appointment for another nonstress test and ultrasound check in 48 horurs. However, if the fetus stays breech, we can try again in a week, or set the date for

a cesarean birth. As a conclusion, cesarean section is considered the largest contributing factor to maternal morbidity after childbirth and encouraging ultrasound-guided external cephalic verion could potentially reduce the rate of cesarean delivery by about one third. We believe UECV is an effective and safe treatment to enable vaginal delivery of breech fetus at term. Using ultrasound control, we can both raise success rates, and control fetus safety during the technique.

Database: EMBASE

4. Cost effectiveness of external cephalic version

Author(s): Muslim I.; Tan I.; Rodriguez P.; Tan T.L.

Source: BJOG: An International Journal of Obstetrics and Gynaecology; Jun 2012; vol. 119 ; p. 121

Publication Date: Jun 2012

Publication Type(s): Conference Abstract

Available in full text at BJOG: An International Journal of Obstetrics and Gynaecology - from John Wiley and Sons

Abstract: Objective: External cephalic version (ECV) is advocated to reduce the incidence of breech presentation at delivery in order to minimise the need for lower segment caesarean section (LSCS). Although ECV has a very low complication rate, it can be painful and has potential complications including placenta abruption, uterine rupture and fetomaternal haemorrhage. Furthermore, despite ECV, three in four breeches will still require LSCS. We evaluated the cost effectiveness of ECV in our unit. Methods: Based on our multi-centred studies of ECV performed in the 6 year period 2006-2011, we have reported a success rate of about 33.2% with a number needed to treat (NNT) to achieve a vaginal delivery of 4.2. The methodology has been described in our abstracts AO622 and AO725. Using the data set from Ealing Hospital only, we identified the length of stay (LoS) for ECV, and postnatally for vaginal delivery, elective and emergency LSCS. Results: Ninety-three ECV's were performed in the 6 year period. A total of 90 cases were analysed after excluding a woman with insufficient data, a woman who had ECV for 2nd twin, and the 2nd record for a woman having her 2nd ECV. The average duration for ECV admission was 1.3 +/- 0.9 (range: 1-6) days. The postnatal length of stay (LoS) for vaginal birth, elective and emergency LSCS were 2.5 +/- 0.7, 3.8 +/- 0.8, 4.6 +/- 0.7 days respectively. The additional cost of managing a breech pregnancy without ECV would be an elective LSCS of 2800 and a 3.8 day postnatal LoS of 1140 giving a total cost of 3940. The additional cost of managing a breech pregnancy with ECV would be an ECV of 279 and a 1.3 day LoS of 390 giving a total cost of 669. 45.6% of the women had elective LSCS costing 114 912, 30.0% had emergency LSCS costing 104 949 and 24.4% had vaginal delivery costing 50 200.56. The average cost of delivery is 3000.68. Proportionately the average postnatal LoS is 3.6 days costing 1080. This gives an average total cost of 4749.68 for managing breech pregnancies with ECV with a net difference of 809.68 compared to those without ECV. Conclusions: From our study, the cost of delivering a breech pregnancy in our unit is higher following ECV than for those who decline the procedure. ECV would be more cost effective if done either as an outpatient or day case procedure where the LoS is <1 day.

Database: EMBASE

5. Estimation of fetomaternal haemorrhage using Kleihauer test in the National Maternity Hospital

Author(s): Byrne J.; Murphy K.; McAuliffe F.; Fadalla K.

Source: British Journal of Haematology; Apr 2012; vol. 157 ; p. 30

Publication Date: Apr 2012

Publication Type(s): Conference Abstract

Available in full text at British Journal of Haematology - from John Wiley and Sons

Abstract:BCSH guidelines for estimation of fetomaternal haemorrhage (FMH) have been recently updated. Acid elution (the Kleihauer test) tests for foetal cells in maternal circulation. It is used to estimate FMH and guide the use of appropriate dose of anti-D to prevent haemolytic disease of the newborn (HDN). Acid elusion is indicated after delivery or following potentially sensitizing events in Rh D-negative women after 20 weeks gestation. The potential sensitizing events include amniocentesis, cordocentesis, antepartum haemorrhage, PV bleeding, external cephalic version, fall, abdominal trauma, intrauterine death, stillbirth, inutero-therapeutic intervention, miscarriage and therapeutic termination of pregnancy. We audited the use of acid elusion test for estimation of FMH in our institute against BCSH guidelines (2009). We found a 12 month period in 2008, there were 744 acid elusion tests done. Of 507 (68%) tests were done inappropriately for Rh D-positive women. In most of the cases the indication of the test was not mentioned in the request form (78%). The commonest stated indication is fall (9%). In the 744 tests that were done, there were 23 tests (3%) significantly positive. Anti-D was given in 45 cases prior to test. In these cases only one insignificantly positive (<2 ml) test was recorded. In conclusion acid elusion test should be offered to Rh Dnegative women after delivery or following potentially sensitizing events after 20 weeks of gestation. Positive acid elusion test should be confirmed by flowcytometry whenever possible, however this should not delay the use of anti-D beyond the recommended 72 hours. The role of flowcytometry is to confirm the potentially significant positive acid elusion test and to exclude the rare possibility of Rh D-negative foetal haemoglobin produced by the mother in condition like haemoglopinpathy and hereditary persistence of foetal haemoglobin. We strongly recommend stating the indication for the test and maternal blood group on the request form.

Database: EMBASE

6. Predictors of successful outcomes after external cephalic version in singleton term breech pregnancies: A nine-year historical cohort study

Author(s): Cho L.Y.; Lau W.L.; Lo T.K.; Tang H.H.T.; Leung W.C.

Source: Hong Kong Medical Journal; Feb 2012; vol. 18 (no. 1); p. 11-19

Publication Date: Feb 2012

Publication Type(s): Article

PubMedID: 22302905

Available in full text at Hong Kong Medical Journal - from Free Access Content

Abstract: Objective To study the success rate, predictors for success, and pregnancy outcomes after external cephalic version. Design Historical cohort study. Setting Regional hospital, Hong Kong. Patients All women who had singleton term breech pregnancies at term and opted for external cephalic version during 2001 and 2009. Their demographic data, clinical and ultrasound findings, procedure details, complications, and delivery outcomes were analysed. Main outcome measures Predictive factors for successful external cephalic version. Results A total of 209 external cephalic versions were performed during the 9-year period. The success rate was 63% (75% for multiparous and 53% for nulliparous women). There was no significant complication. On univariate analysis, predictors of successful external cephalic version were: multiparity, unengaged presenting part,

higher amniotic fluid index (>=10 cm), thin abdominal wall, low uterine tone, and easily palpable fetal head (subjective assessment by practitioners before external cephalic version). On multivariate analysis, only multiparity, non-engagement of the fetal buttock and thin maternal abdomen were associated with successful external cephalic version. In all, 69% of those who had successful external cephalic version succeeded in the first roll (P<0.001), and 82% of the women with successful external cephalic versions had vaginal deliveries (93% in multiparous and 69% in nulliparous women). Uptake rate of external cephalic version was studied in the latter part of the study period (2006-2009). Whilst 735 women were eligible for external cephalic version, 131 women chose to have the procedure resulting in an uptake rate of 18%. Conclusion External cephalic version was effective in reducing breech presentations at term and corresponding caesarean section rates, but the uptake rate was low. Further work should address the barriers to the low acceptance of external cephalic version. The results of this study could encourage women to opt for external cephalic version.

Database: EMBASE

7. External cephalic version: A review of the evidence

Author(s): Burgos J.; Cobos P.; Rodriguez L.; Osuna C.; Melchor J.C.; Fernandez-Llebrez L.; Martinez-Astorquiza T.

Source: Current Women's Health Reviews; Nov 2011; vol. 7 (no. 4); p. 405-415

Publication Date: Nov 2011

Publication Type(s): Review

Abstract: External cephalic version (ECV) is an obstetric maneuver that rotates the fetus to a cephalic presentation in case of breech, oblique or transverse lie presentations. During the past 14 years, the most relevant studies (n >200 patients) reveal success rates ranging from 37% to 78.7%. The contraindications of ECV are: when a clear indication for a cesarean delivery exists, fetal compromise, placenta praevia, placenta abruption, intrauterine fetal death, rupture of membranes, multiple gestation, Rh sensitivization, uterine abnormalities and coagulation disorders. ECV was only contraindicated in 4% of breech presentations. Many authors have examined the factors associated with ECV success rate. We did not identify any factor that showed a constant association across all studies. The goal of describing factors associated with ECV success rate is to determine whether they can be enhanced, thus contributing to improve ECV success rate. Studies have focused on three different actuations: tocolysis, regional analgesia and amnioinfusion. ECV is not alien to complications, although the risk of complications remains low when performed correctly. The reported complications are transitory alteration of cardiotocography, feto-maternal transfusion, urgent cesarean delivery, perinatal mortality, vaginal hemorrhage, premature detachment of the placenta. The final goal of ECV is to decrease the presence of breech presentations at the time of labor and thus reduce the rate of cesarean sections. A meta-analysis of the Cochrane review observed a significant decrease in the rate of cesarean sections (RR=0.52; CI95%=0.39-0.71) in patients subject to ECV at term without worse perinatal outcomes.

Database: EMBASE

8. Flowcytometric assessment of fetomaternal hemorrhage during external cephalic version at term.

Author(s): Scholz, Christoph; Kachler, Andrea; Hermann, Christine; Weissenbacher, Tobias; Toth, Bettina; Friese, Klaus; Kainer, Franz

Source: Journal of perinatal medicine; 2009; vol. 37 (no. 4); p. 334-337

Publication Date: 2009

Publication Type(s): Research Support, Non-u.s. Gov't Journal Article

PubMedID: 19290855

Abstract: External cephalic version (ECV) at term is a safe procedure and reduces the incidence of cesarean sections for breech presentation. One of the known complications, however, is an ECV-related disruption of the placental barrier and a subsequent transfusion of fetal blood into maternal circulation. While the incidence of ECV-related fetomaternal hemorrhage (FMH) has been determined recently in a large trial using a manual Kleihauer-Betke test (KBT), questions remain on the amount of ECV-related FMH. KBT, which detects fetal red blood cells (RBC) on the basis of acidic resistance of fetal hemoglobin (HbF), is known to be a sensitive test, yet prone to procedural errors limiting its accuracy in quantifying FMH. In this study we investigated 50 patients for FMH before and after ECV, using a dual-color flow cytometric test kit with a lower limit of quantification of 0.05% fetal RBC in maternal peripheral blood. Three patients had a quantifiable increase of fetal RBC detected after ECV (0.06%; 0.08%; 0.1%). None of these subtle increments was predictable by ECV-related clinical parameters or translated into fetal compromise. Using a sensitive and accurate flow cytometric test method, our data provide further assurance to mothers on the safety of ECV at term.

Database: Medline

9. Obstetric management in Rh alloimmunizated pregnancy.

Author(s): Cacciatore, Alessandra; Rapiti, Stefania; Carrara, Sabina; Cavaliere, Alessandro; Ermito, Santina; Dinatale, Angela; Imbruglia, Laura; Recupero, Stefania; La Galia, Tindara; Pappalardo, Elisa Maria; Accardi, Manuela Chiara

Source: Journal of prenatal medicine; Apr 2009; vol. 3 (no. 2); p. 25-27

Publication Date: Apr 2009

Publication Type(s): Journal Article

PubMedID: 22439037

Available in full text at Journal of Prenatal Medicine - from National Library of Medicine

Abstract: Rh alloimmunization occurs when maternal immune system is sensitized to D(Rh) erythrocyte surface antigens.The most common causes of maternal Rh alloimmunisation are blood transfusion and antepartum or intrapartum fetomaternal hemorrhage (abdominal trauma, abortion, ectopic pregnancy, invasive obstetric procedures, placental abruption, external cephalic version).The risk of alloimmunization is affected by several factors, including the degree of fetomaternal hemorrhage and maternal immune respons.Although the introduction of anti D prophylaxis reduced dramatically the rate of alloimmunization in susceptible women, his prevention is not universal and about 0.3% of susceptible women still become Rh D alloimmunized.The aim of this article is to review the management of the Rh alloimmunizated pregnant.

Database: Medline

10. Fetomaternal hemorrhage during external cephalic version.

Author(s): Boucher, Marc; Marquette, Gerald P; Varin, Jocelyne; Champagne, Josette; Bujold, Emmanuel

Source: Obstetrics and gynecology; Jul 2008; vol. 112 (no. 1); p. 79-84

Publication Date: Jul 2008

Publication Type(s): Journal Article

PubMedID: 18591311

Available in full text at Obstetrics and Gynecology - from Ovid

Abstract:OBJECTIVETo estimate the frequency and volume of fetomaternal hemorrhage during external cephalic version for term breech singleton fetuses and to identify risk factors involved with this complication.METHODSA prospective observational study was performed including all patients undergoing a trial of external cephalic version for a breech presentation of at least 36 weeks of gestation between 1987 and 2001 in our center. A search for fetal erythrocytes using the standard Kleihauer-Betke test was obtained before and after each external cephalic version. The frequency and volume of fetomaternal hemorrhage were calculated. Putative risk factors for fetomaternal hemorrhage were evaluated by chi(2) test and Mann-Whitney U test.RESULTSA Kleihauer-Betke test result was available before and after 1,311 trials of external cephalic version. The Kleihauer-Betke test was positive in 67 (5.1%) before the procedure. Of the 1,244 women with a negative Kleihauer-Betke test before external cephalic version, 30 (2.4%) had a positive Kleihauer-Betke test after the procedure. Ten (0.8%) had an estimated fetomaternal hemorrhage greater than 1 mL, and one (0.08%) had an estimated fetomaternal hemorrhage greater than 30 mL. The risk of fetomaternal hemorrhage was not influenced by parity, gestational age, body mass index, number of attempts at version, placental location, or amniotic fluid index.CONCLUSIONThe risk of detectable fetomaternal hemorrhage during external cephalic version was 2.4%, with fetomaternal hemorrhage more than 30 mL in less than 0.1% of cases. These data suggest that the performance of a Kleihauer-Betke test is unwarranted in uneventful external cephalic version and that in Rh-negative women, no further Rh immune globulin is necessary other than the routine 300-microgram dose at 28 weeks of gestation and postpartum.LEVEL OF EVIDENCEII.

Database: Medline

11. Massive fetomaternal hemorrhage following failed external cephalic version: case report.

Author(s): Khoo, Cheen Leen; Bollapragada, Shrikant; Mackenzie, Fiona

Source: Journal of perinatal medicine; 2006; vol. 34 (no. 3); p. 250-251

Publication Date: 2006

Publication Type(s): Letter Case Reports

PubMedID: 16602849

Database: Medline

12. Role of Kleihauer test in Rhesus negative pregnancy.

Author(s): Mahboob, Urooj; Mazhar, Syeda Batool

Source: Journal of the College of Physicians and Surgeons--Pakistan : JCPSP; Feb 2006; vol. 16 (no. 2); p. 120-123

Publication Date: Feb 2006

Publication Type(s): Journal Article

PubMedID: 16499805

Abstract:OBJECTIVETo determine the role of Kleihauer test in estimating fetomaternal haemorrhage and dose of injection anti-D.DESIGNAnalytical study.PLACE AND DURATION OF STUDYMCH Center, Unit-II, PIMS, Islamabad, from February to December 2004.PATIENTS AND METHODSA hundred Rhesus negative pregnant women delivered after 28 weeks gestation during the study period were studied. The main outcome measures were Kleihauer test estimation of fetomaternal haemorrhage and association of significant fetomaternal haemorrhage with antepartum haemorrhage (APH), amniocentesis, twin delivery, intrauterine death (IUD), external cephalic version (ECV), manual removal of placenta and cesarean section.RESULTSAmong the hundred women, 28 were primigravidae while 72 were multigravidae. Mean gestational age at delivery was 38.4+/-1.6 weeks. In 24% Rhesus-D negative subjects, potential sensitizing events occurred antenatally. In 11% of these, events occurred before 24 weeks of gestation. Two percent underwent ECV, 10 % had blunt abdominal trauma in third trimester while one patient had APH. Sixty five women had vaginal delivery and cesarean section was performed in 35. Outcome was alive baby in all cases except one intrauterine fetal demise (IUD). Four patients had placenta removed manually. Mean amount of fetomaternal haemorrhage was 2.7+/-1.01 ml (1.2-5.2 ml). The mean anti-D dose required was 67.3+/-25.3 microg. Twenty six women did not need anti-D as they had Rhesus negative infants.CONCLUSIONIn this series routine postnatal Rhesus prophylaxis with 300 microg anti-D immunoglobulin covered all the feto-maternal haemorrhage. Therefore, Kleihauer test with added burden of cost is not indicated as a routine to rhesus negative women.

Database: Medline

13. Massive feto-maternal haemorrhage with good perinatal outcome following failed external cephalic version.

Author(s): Shankar, M; Gough, G W; Chakravarti, S; Vellacott, I D

Source: Fetal diagnosis and therapy; 2004; vol. 19 (no. 1); p. 68-71

Publication Date: 2004

Publication Type(s): Case Reports Journal Article

PubMedID: 14646421

Abstract:OBJECTIVETo reinforce the risk of feto-maternal haemorrhage associated with external cephalic version for breech presentation.METHODA single case report with a literature review.RESULTSOur case report was associated with the largest feto-maternal haemorrhage following external cephalic version reported so far. The perinatal outcome in this case was favourable despite a significant amount of fetal haemorrhage. The literature review did include cases with unfavourable outcomes. No reliable method of monitoring fetuses with feto-maternal haemorrhage has been reported, although middle cerebral artery Doppler studies appear to show promise.CONCLUSION External cephalic version is useful in the management of breech presentations at term, but it is not without risks and clinicians need to be aware of this.

Database: Medline

14. External cephalic version: a safe procedure? A systematic review of version-related risks.

Author(s): Collaris, Ronald J; Oei, S Guid

Source: Acta obstetricia et gynecologica Scandinavica; Jun 2004; vol. 83 (no. 6); p. 511-518

Publication Date: Jun 2004

Publication Type(s): Journal Article Review

PubMedID: 15144330

Available in full text at Acta Obstetricia et Gynecologica Scandinavica - from John Wiley and Sons

Abstract:BACKGROUNDThe Term Breech Trial has considerably increased the number of cesareans. External cephalic version (ECV) might be an effective method of lowering the rate of cesareans; its efficacy has been well established. However, although in the absence of anesthesia the risks are thought to be low, most studies have used populations too small to allow definite conclusions on version-related risks.METHODSIn an attempt to make an inventory of these risks, we have systematically analyzed 44 studies, covering a total of 7377 patients from 1990 to 2002. The studies used were derived from a Medline and Embase search.RESULTSThe most frequently reported complications were transient abnormal cardiotocography (CTG) patterns (5.7%). Persisting pathological CTG readings (0.37%) and vaginal bleeding occur rarely (0.47%). The incidence of placental abruption was even lower, at 0.12%. Fetomaternal transfusion was absent in five out of seven studies, with a mean incidence of 3.7%. Emergency cesareans were performed in 0.43% of all versions. Perinatal mortality was 0.16%.CONCLUSIONSExternal cephalic version seems to be a safe procedure.

Database: Medline

15. Prevention of Rh alloimmunization.

Author(s): Fung Kee Fung, Karen; Eason, Erica; Crane, Joan; Armson, Anthony; De La Ronde, Sandra; Farine, Dan; Keenan-Lindsay, Lisa; Leduc, Line; Reid, Gregory J; Aerde, John Van; Wilson, R Douglas; Davies, Gregory; Désilets, Valérie A; Summers, Anne; Wyatt, Philip; Young, David C; Maternal-Fetal Medicine Committee, Genetics Committee

Source: Journal of obstetrics and gynaecology Canada : JOGC = Journal d'obstetrique et gynecologie du Canada : JOGC; Sep 2003; vol. 25 (no. 9); p. 765-773

Publication Date: Sep 2003

Publication Type(s): Practice Guideline Guideline Journal Article

PubMedID: 12970812

Abstract:OBJECTIVETo provide guidelines on use of anti-D prophylaxis to optimize prevention of rhesus (Rh) alloimmunization in Canadian women.OUTCOMESDecreased incidence of Rh alloimmunization and minimized practice variation with regards to immunoprophylaxis strategies.EVIDENCEThe Cochrane Library and MEDLINE were searched for English-language articles from 1968 to 2001, relating to the prevention of Rh alloimmunization. Search terms included: Rho(D) immune globulin, Rh iso- or allo-immunization, anti-D, anti-Rh, WinRho, Rhogam, and pregnancy. Additional publications were identified from the bibliographies of these articles. All study types were reviewed. Randomized controlled trials were considered evidence of highest quality, followed by cohort studies. Key individual studies on which the principal recommendations are based are referenced. Supporting data for each recommendation is briefly summarized with evaluative comments and referenced.VALUESThe evidence collected was reviewed by the Maternal-Fetal Medicine and Genetics Committees of the Society of Obstetricians and Gynaecologists of Canada

(SOGC) and quantified using the Evaluation of Evidence guidelines developed by the Canadian Task Force on the Periodic Health Exam.RECOMMENDATIONS1. Anti-D Ig 300 microg IM or IV should be given within 72 hours of delivery to a postpartum nonsensitized Rh-negative woman delivering an Rh-positive infant. Additional anti-D Ig may be required for fetomaternal hemorrhage (FMH) greater than 15 mL of fetal red blood cells (about 30 mL of fetal blood). Alternatively, anti-D Ig 120 microg IM or IV may be given within 72 hours of delivery, with testing and additional anti-D Ig given for FMH over 6 mL of fetal red blood cells (12 mL fetal blood). (I-A) 2. If anti-D is not given within 72 hours of delivery or other potentially sensitizing event, anti-D should be given as soon as the need is recognized, for up to 28 days after delivery or other potentially sensitizing event. (III-B) 3. There is poor evidence regarding inclusion or exclusion of routine testing for postpartum FMH, as the cost-benefit of such testing in Rh mothers at risk has not been determined. (III-C) 4. Anti-D Ig 300 microg should be given routinely to all Rh-negative nonsensitized women at 28 weeks' gestation when fetal blood type is unknown or known to be Rh-positive. Alternatively, 2 doses of 100-120 microg may be given (120 microg being the lowest currently available dose in Canada): one at 28 weeks and one at 34 weeks. (I-A) 5. All pregnant women (D-negative or D-positive) should be typed and screened for alloantibodies with an indirect antiglobulin test at the first prenatal visit and again at 28 weeks. (III-C) 6. When paternity is certain, Rh testing of the baby's father may be offered to all Rh-negative pregnant women to eliminate unnecessary blood product administration. (III-C) 7. A woman with "weak D" (also known as Du-positive) should not receive anti-D. (III-D) 8. A repeat antepartum dose of Rh immune globulin is generally not required at 40 weeks, provided that the antepartum injection was given no earlier than 28 weeks' gestation. (III-C) 9. After miscarriage or threatened abortion or induced abortion during the first 12 weeks of gestation, nonsensitized D-negative women should be given a minimum anti-D of 120 microg. After 12 weeks' gestation, they should be given 300 microg. (II-3B) 10. At abortion, blood type and antibody screen should be done unless results of blood type and antibody screen during the pregnancy are available, in which case antibody screening need not be repeated. (III-B) 11. Anti-D should be given to nonsensitized D-negative women following ectopic pregnancy. A minimum of 120 microg should be given before 12 weeks' gestation and 300 microg after 12 weeks' gestation. (III-B) 12. Anti-D should be given to nonsensitized D-negative women following molar pregnancy because of the possibility of partial mole. Anti-D may be withheld if the diagnosis of complete mole is certain. (III-B) 13. At amniocentesis, anti-D 300 microg should be given to nonsensitized D-negativeesis, anti-D 300 microg should be given to nonsensitized D-negative women. (II-3B) 14. Anti-D should be given to nonsensitized D-negative women following chorionic villous sampling, at a minimum dose of 120 microg during the first 12 weeks' gestation, and at a dose of 300 microg after 12 weeks' gestation. (II-B) 15. Following cordocentesis, anti-D Ig 300 microg should be given to nonsensitized D-negative women. (II-3B) 16. Quantitative testing for FMH may be considered following events potentially associated with placental trauma and disruption of the fetomaternal interface (e.g., placental abruption, blunt trauma to the abdomen, cordocentesis, placenta previa with bleeding). There is a substantial risk of FMH over 30 mL with such events, especially with blunt trauma to the abdomen. (III-B) 17. Anti-D 120 microg or 300 microg is recommended in association with testing to quantitate FMH following conditions potentially associated with placental trauma and disruption of the fetomaternal interface (e.g., placental abruption, external cephalic version, blunt trauma to the abdomen, placenta previa with bleeding). If FMH is in excess of the amount covered by the dose given (6 mL or 15 mL fetal RBC), 10 microg additional anti-D should be given for every additional 0.5 mL fetal red blood cells. There is a risk of excess FMH, especially when there has been blunt trauma to the abdomen. (III-B) 18. Verbal or written informed consent must be obtained prior to administration of the blood product Rh immune globulin. (III-C) VALIDATION: These guidelines have been reviewed by the Maternal-Fetal Medicine Committee and the Genetics Committee, with input from the Rh Program of Nova Scotia. Final approval has been given by the Executive and Council of the Society of Obstetricians and Gynaecologists of Canada.

Database: Medline

16. Cell-free fetal deoxyribonucleic acid in maternal circulation as a marker of fetal-maternal hemorrhage in patients undergoing external cephalic version near term.

Author(s): Lau, T K; Lo, K W; Chan, L Y; Leung, T Y; Lo, Y M

Source: American journal of obstetrics and gynecology; Sep 2000; vol. 183 (no. 3); p. 712-716

Publication Date: Sep 2000

Publication Type(s): Journal Article

PubMedID: 10992198

Abstract:OBJECTIVEOur aim was to investigate whether external cephalic version performed near term increases the concentration of cell-free fetal deoxyribonucleic acid in maternal plasma.STUDY DESIGNForty-five patients who had singleton male fetuses and were undergoing external cephalic version at or beyond 36 weeks of gestation were recruited during a 20-month period. Maternal venous blood samples were taken before and within 10 minutes after external cephalic version. Deoxyribonucleic acid was extracted from the plasma samples. The amount of fetal deoxyribonucleic acid was quantified by means of the SRY gene on the Y chromosome as a fetal marker. The change in SRY gene concentration before and after external cephalic version was compared by paired sample t test.RESULTSThere was a significant increase in the concentration of fetal deoxyribonucleic acid in maternal serum after external cephalic version (before, 296 +/- 209 copies per milliliter; after, 369 +/- 228 copies per milliliter; P =.014). This increase in the concentration of deoxyribonucleic acid was most profound among the nulliparous patients after a successful version and in the presence of a posterior placenta. The location of the placenta was found to be the most significant factor accounting for the change in the deoxyribonucleic acid concentration.CONCLUSIONSExternal cephalic version near term imposed a significant disturbance to the maternalplacental interface. Fetal deoxyribonucleic acid is a sensitive marker that is useful in the assessment of subclinical fetal-maternal hemorrhage.

Database: Medline

17. Fetal complication after external cephalic version at term: case report and literature review.

Author(s): Ghidini, A; Korker, V

Source: The Journal of maternal-fetal medicine; 1999; vol. 8 (no. 4); p. 190-192

Publication Date: 1999

Publication Type(s): Case Reports Journal Article Review

PubMedID: 10406304

Abstract: We report a case of fetal distress following external cephalic version at term, which resulted in delivery by emergency cesarean section of an anemic, acidemic infant. The characteristics of the fetal heart rate tracing, the clinical findings, and a positive Kleihauer-Betke test after delivery suggest that fetomaternal hemorrhage or placental abruption was the most likely cause of the fetal distress. We review the incidence of the reported fetal complications after external version.

Database: Medline

18. Fetomaternal haemorrhage after external cephalic version at term.

Author(s): Lau, T K; Stock, A; Rogers, M

Source: The Australian & New Zealand journal of obstetrics & gynaecology; May 1995; vol. 35 (no. 2); p. 173-174

Publication Date: May 1995

Publication Type(s): Journal Article

PubMedID: 7677681

Available in print at Patricia Bowen Library and Knowledge Service West Middlesex university Hospital - from Australian and New Zealand Journal of Obstetrics and Gynaecology

Abstract: The incidence of fetomaternal haemorrhage after external cephalic version was 1.8% in 167 patients. The occurrence of this complication was not found to be associated with difficult or unsuccessful version, or with any adverse perinatal outcome. We conclude that routine assessment of fetomaternal haemorrhage after external version is not necessary, except in rhesus negative women to detect the 2% in whom the routine dose of 500 iu (100 micrograms) of anti-D immunoglobulin is inadequate.

Database: Medline

19. 100 cases of external cephalic version, with special reference to fetomaternal transfusion.

Author(s): Nord, E; Blaschke, E; Green, K; Thomassen, P

Source: Acta obstetricia et gynecologica Scandinavica; 1989; vol. 68 (no. 1); p. 55-58

Publication Date: 1989

Publication Type(s): Case Reports Journal Article

PubMedID: 2477985

Abstract: The incidence of fetomaternal transfusion (FMT) and localization of the placenta was studied in 100 attempted external versions (ECV). In only one case could a significant FMT be detected with the Kleihauer-Betke test. No major complications occurred. Sixty per cent of the attempted versions were successful. Multiparity and either dorsal or fundal placental localization were found to be favorable factors. The determination of AFP was of no use for the detection of FMT.

Database: Medline

20. External cephalic version at term: is a tocolytic necessary?

Author(s): Robertson, A W; Kopelman, J N; Read, J A; Duff, P; Magelssen, D J; Dashow, E E

Source: Obstetrics and gynecology; Dec 1987; vol. 70 (no. 6); p. 896-899

Publication Date: Dec 1987

Publication Type(s): Randomized Controlled Trial Clinical Trial Journal Article

PubMedID: 3684126

Abstract: This prospective investigation evaluates the benefit of a beta-mimetic tocolytic for external cephalic version. From July 1, 1984 to May 15, 1987, 58 patients who had breech presentations between 37-41 weeks' gestation were considered for external cephalic version. The patients were randomly assigned to one of two groups: tocolytic or no tocolytic. An ultrasound examination, serum alpha-fetoprotein (AFP), Kleihauer-Betke test, and nonstress test (NST) were performed before and after the attempt at version. A version was not attempted if there was evidence of intrauterine

growth retardation (IUGR), oligohydramnios, or a nonreactive NST. Patients in the tocolytic group received 200 micrograms/minute of ritodrine hydrochloride for 20 minutes via continuous intravenous infusion before a version was attempted. Twenty of the 30 patients (66.7%) in the tocolytic group and 19 of the 28 patients (67.8%) in the no-tocolytic group had successful versions, a nonsignificant difference. The nine patients with unsuccessful version attempts in the group without a tocolytic then received intravenous ritodrine and underwent a second attempt. Only one of these nine attempts was successful. There were no serious maternal or fetal complications associated with the attempts at version. In our patient population, use of a tocolytic did not significantly increase the probability of a successful version.

Database: Medline

21. Severe neonatal anemia possibly caused by spontaneous cephalic version, with excellent outcome--a case report.

Author(s): Franckx, J; Sacre-Smits, L

Source: Journal of perinatal medicine; 1984; vol. 12 (no. 3); p. 147-150

Publication Date: 1984

Publication Type(s): Case Reports Journal Article

PubMedID: 6502441

Abstract:A 29-year-old primipara with breech presentation had a spontaneous cephalic version a few days before her admission. She was hospitalised because of a sudden decrease in fetal movements perceived. During labour a sinusoidal fetal heart rate pattern was observed. The mother gave birth to a strikingly pale 3250 g weighing boy. His APGAR score was 1/5/6. Cord hemoglobin was 2.9 g/dl and an acid elution test showed the presence of 9.1% fetal red cells in the maternal circulation. Following a transfusion of packed cells and total blood, the babies hemoglobin rose to above 10 g/dl. On the second day of life he developed an acute functional renal failure which responded well to fluid restriction and furosemide administration. Upon discharge, 10 days after birth, the physical and neurological examination were normal. At present time the child is two years old and thriving well. Anemia in the newborn due to occult blood loss may be the result of bleeding of the fetus into the maternal circulation. The incidence of a massive transplacental blood loss is increased by traumatic amniocentesis, by external cephalic version and during cesarian section. As illustrated by the present case, spontaneous cephalic version may possibly account for another cause of feto-maternal transfusion resulting in severe neonatal anemia. Severe anemia at birth secondary to an acute and massive feto-maternal hemorrhage is commonly associated with a poor prognosis. Under such conditions immediate re-expansion of the blood volume proved to be life saving.

Database: Medline

22. External cephalic version with tocolysis. Observations and continuing experience at the Los Angeles County/University of Southern California Medical Center.

Author(s): Wallace, R L; VanDorsten, J P; Eglinton, G S; Meuller, E; McCart, D; Schifrin, B S

Source: The Journal of reproductive medicine; Oct 1984; vol. 29 (no. 10); p. 745-748

Publication Date: Oct 1984

Publication Type(s): Research Support, Non-u.s. Gov't Journal Article

PubMedID: 6150997

Abstract: We considered 113 consecutive patients for attempted external cephalic version with tocolysis (ECV-T) after 37 weeks' gestation. We randomized the first patients to the control group (no ECV-T attempted, 23 patients) or the study group (ECV-T attempted, 25 patients). Nine patients were excluded, and ECV-T was then considered for 88 patients, with a success rate of 77% for the 104 total attempts. Six patients were lost to follow-up. In the successful ECV-T group, 71 of 75 patients (95%) presented the vertex in labor, while 4 patients (5%) reverted to breech. Uterine exploration at delivery revealed uterine anomalies in three of the patients who reverted. The cesarean rate was 25% in the successful-ECV-T group and 87% in the failed-ECV-T group. In the initial group, four patients (18%) spontaneously converted to cephalic presentations after 37 weeks. None of the failed-ECV-T patients spontaneously converted to cephalic presentations. The cesarean rate for the control and failed-ECV-T patients presenting the breech intrapartum was 88%. Complications included transient fetal bradycardia in 37 patients (36%), evidence of fetomaternal bleeding (positive Kleihauer-Betke test) in 2 patients (2%) and one fetal demise three weeks following successful ECV-T and diagnosed at the onset of labor. We lowered the cesarean section rate for breech presentation in labor with the selective application of ECV-T late in gestation. We consider this technique to be a powerful addition to our armamentarium for managing the term breech presentation.

Database: Medline

23. Fetomaternal bleeding during attempts at external version.

Author(s): Gjøde, P; Rasmussen, T B; Jørgensen, J

Source: British journal of obstetrics and gynaecology; Jul 1980; vol. 87 (no. 7); p. 571-573

Publication Date: Jul 1980

Publication Type(s): Journal Article

PubMedID: 7426510

Abstract: The frequency and size of fetomaternal bleeds during the first attempt at external version of the fetus in breech presentation in 50 pregnant women were investigated. Fetomaternal bleeds of 0.1 to 1.5 ml were detected in 14 women (28 per cent). It is concluded that rhesus negative women should be given anti-D before attempts at external version are made.

Database: Medline

24. Massive feto-maternal transfusion during external cephalic version, with fatal outcome.

Author(s): Luyet, F; Schmid, J; Maroni, E; Duc, G

Source: Archiv fur Gynakologie; Oct 1976; vol. 221 (no. 3); p. 273-275

Publication Date: Oct 1976

Publication Type(s): Case Reports Journal Article

PubMedID: 990066

Abstract:A primipara with breech presentation underwent external cephalic version under tocolysis 9 days before term. The placenta was located on the anterior uterine wall. During the version, a massive feto-maternal transfusion occurred and the baby ultimately died.

Database: Medline

25. Feto-maternal haemorrhage following successful and unsuccessful attempts at external cephalic version.

Author(s): Marcus, R G; Crewe-Brown, H; Krawitz, S; Katz, J

Source: British journal of obstetrics and gynaecology; Jul 1975; vol. 82 (no. 7); p. 578-580

Publication Date: Jul 1975

Publication Type(s): Journal Article

PubMedID: 807231

Abstract: In the present study, 6 out of 100 patients who had an attempted or actual external cephalic version (ECV) showed significant feto-maternal haemorrhage, the amount being greatest in patients with "failed" external versions. Thus ECV may be a source of rhesus iso-immunization in a rhesus negative mother with a rhesus positive fetus and should not be performed unless the father is a rhesus negative. If, however, an ECV has been attempted, fetal cell counts should then be made and rhesus immunoprophylaxis administered if necessary.

Database: Medline

26. Transplacental haemorrhage after external cephalic version

Author(s): Pollock A.

Source: Lancet; Mar 1968; vol. 1 (no. 7543); p. 612

Publication Date: Mar 1968

Publication Type(s): Article

PubMedID: 4170900

Database: EMBASE

Strategy 265702

#	Database	Search term	Results
1	Medline	("External cephalic version*").ti,ab	587
2	Medline	(ECV).ti,ab	1430
3	Medline	(1 OR 2)	1780
4	Medline	(fetomaternal ADJ2 haemorrhag*).ti,ab	98
5	Medline	(fetomaternal ADJ2 hemorrhag*).ti,ab	339
6	Medline	("feto maternal" ADJ2 hemorrhag*).ti,ab	52
7	Medline	("feto maternal" ADJ2 haemorrhag*).ti,ab	49
8	Medline	(fetal-maternal ADJ2 hemorrhag*).ti,ab	62
9	Medline	(fetal-maternal ADJ2 haemorrhag*).ti,ab	4
10	Medline	exp "FETOMATERNAL TRANSFUSION"/	1181
11	Medline	("FETOMATERNAL TRANSFUSION").ti,ab	117
12	Medline	("FETO MATERNAL TRANSFUSION").ti,ab	60
14	Medline	("FETAL-MATERNAL TRANSFUSION").ti,ab	18
15	Medline	(4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 14)	1397
16	Medline	(3 AND 15)	20
17	Medline	("Kleihaur test").ti,ab	0

18	Medline	("Kleihauer-Betke" ADJ2 TEST*).ti,ab	132
19	Medline	("Kleihauer-Betke" ADJ2 stain*).ti,ab	26
20	Medline	(Kleihauer ADJ2 test*).ti,ab	219
21	Medline	(" Acid elution test*").ti,ab	16
22	Medline	(18 OR 19 OR 20 OR 21)	256
23	Medline	(3 AND 22)	11
24	Medline	("anti-D").ti,ab	2745
25	Medline	exp "RHO(D) IMMUNE GLOBULIN"/	1245
26	Medline	("Rho(D) Immune Globulin").ti,ab	55
27	Medline	(24 OR 25 OR 26)	3223
28	Medline	(3 AND 27)	8
29	Medline	exp "VERSION, FETAL"/	738
30	Medline	(15 AND 29)	15
31	Medline	(22 AND 29)	8
32	Medline	(27 AND 29)	2
33	EMBASE	("External cephalic version*").ti,ab	787
34	EMBASE	(ECV).ti,ab	3398
35	EMBASE	exp "EXTERNAL CEPHALIC VERSION"/	326
36	EMBASE	(33 OR 34 OR 35)	3853
37	EMBASE	("Kleihaur test").ti,ab	0

38	EMBASE	("Kleihauer-Betke" ADJ2 TEST*).ti,ab	182
39	EMBASE	("Kleihauer-Betke" ADJ2 stain*).ti,ab	27
40	EMBASE	(Kleihauer ADJ2 test*).ti,ab	289
41	EMBASE	(" Acid elution test*").ti,ab	35
42	EMBASE	(38 OR 39 OR 40 OR 41)	349
43	EMBASE	("anti-D").ti,ab	4316
44	EMBASE	("Rho(D) Immune Globulin").ti,ab	56
45	EMBASE	exp "RHESUS D ANTIBODY"/	3805
46	EMBASE	(43 OR 44 OR 45)	5887
47	EMBASE	(fetomaternal ADJ2 haemorrhag*).ti,ab	130
48	EMBASE	(fetomaternal ADJ2 hemorrhag*).ti,ab	396
49	EMBASE	("feto maternal" ADJ2 hemorrhag*).ti,ab	70
50	EMBASE	("feto maternal" ADJ2 haemorrhag*).ti,ab	72
51	EMBASE	(fetal-maternal ADJ2 hemorrhag*).ti,ab	81
52	EMBASE	(fetal-maternal ADJ2 haemorrhag*).ti,ab	8
53	EMBASE	exp "FETOMATERNAL TRANSFUSION"/	12440
54	EMBASE	("FETOMATERNAL TRANSFUSION").ti,ab	133
55	EMBASE	("FETO MATERNAL TRANSFUSION").ti,ab	69

56	EMBASE	("FETAL-MATERNAL TRANSFUSION").ti,ab	18
57	EMBASE	exp "FETOMATERNAL TRANSFUSION"/	12440
58	EMBASE	(47 OR 48 OR 49 OR 50 OR 51 OR 52 OR 53 OR 54 OR 55 OR 56 OR 57)	12713
59	EMBASE	(36 AND 42)	12
60	EMBASE	(36 AND 46)	11
61	EMBASE	(36 AND 58)	32
62	EMBASE	exp "RHESUS ISOIMMUNIZATION"/	1585
63	EMBASE	(36 AND 62)	6
64	PubMed	("External cephalic version*").ti,ab	584
65	PubMed	(ECV).ti,ab	1439
66	PubMed	(64 OR 65)	1783
67	PubMed	("anti-D").ti,ab	2746
68	PubMed	exp "RHO(D) IMMUNE GLOBULIN"/	0
69	PubMed	("Rho(D) Immune Globulin").ti,ab	1277
70	PubMed	(67 OR 68 OR 69)	3224
71	PubMed	(66 AND 70)	8
72	PubMed	(fetomaternal ADJ2 haemorrhag*).ti,ab	79
73	PubMed	(fetomaternal ADJ2 hemorrhag*).ti,ab	305

74	PubMed	("feto maternal" ADJ2 hemorrhag*).ti,ab	101
75	PubMed	("feto maternal" ADJ2 haemorrhag*).ti,ab	70
76	PubMed	(fetal-maternal ADJ2 hemorrhag*).ti,ab	61
77	PubMed	(fetal-maternal ADJ2 haemorrhag*).ti,ab	4
78	PubMed	exp "FETOMATERNAL TRANSFUSION"/	0
79	PubMed	("FETOMATERNAL TRANSFUSION").ti,ab	1203
80	PubMed	("FETO MATERNAL TRANSFUSION").ti,ab	60
81	PubMed	("FETAL-MATERNAL TRANSFUSION").ti,ab	18
82	PubMed	(72 OR 73 OR 74 OR 75 OR 76 OR 77 OR 78 OR 79 OR 80 OR 81)	1431
83	PubMed	(66 AND 82)	20
84	PubMed	("Kleihauer-Betke" ADJ2 TEST*).ti,ab	133
85	PubMed	("Kleihauer-Betke" ADJ2 stain*).ti,ab	39
86	PubMed	(Kleihauer ADJ2 test*).ti,ab	85
87	PubMed	(" Acid elution test*").ti,ab	15
88	PubMed	(84 OR 85 OR 86 OR 87)	245
89	PubMed	(66 AND 88)	11