

OBSTETRICS

Neonatal morbidity associated with shoulder dystocia maneuvers

Janine E. Spain, MD; Heather A. Frey, MD, MSCI; Methodius G. Tuuli, MD, MPH; Ryan Colvin, MPH; George A. Macones, MD, MSCE; Alison G. Cahill, MD, MSCI

OBJECTIVE: We sought to examine neonatal morbidity associated with different maneuvers used among term patients who experience a shoulder dystocia.

STUDY DESIGN: We conducted a retrospective cohort study of all women who experienced a clinically diagnosed shoulder dystocia at term requiring obstetric maneuvers at a single tertiary care hospital from 2005 through 2008. We excluded women with major fetal anomaly, intrauterine death, multiple gestation, and preterm. Women exposed to Rubin maneuver, Wood's screw maneuver, or delivery of the posterior arm were compared to women delivered by McRoberts/suprapubic pressure only, which served as the reference group. The primary outcome was a composite morbidity of neonatal injury (defined as clavicular or humeral fracture or brachial plexus injury) and neonatal depression (defined as Apgar <7 at 5 minutes, arterial cord pH <7.1, continuous positive airway pressure use, intubation, or respiratory distress). Logistic regression was used to adjust for nulliparity and

duration of shoulder dystocia, defined as time from delivery of fetal head to delivery of shoulders.

RESULTS: Among the 231 women who met inclusion criteria, 135 were delivered by McRoberts/suprapubic pressure alone (57.9%), 83 women were exposed to Rubin maneuver, 53 women were exposed to Wood's screw, and 36 women were exposed to delivery of posterior arm. Individual maneuvers were not associated with composite morbidity, neonatal injury, or neonatal depression after adjusting for nulliparity and duration of shoulder dystocia.

CONCLUSION: We found no association between shoulder dystocia maneuvers and neonatal morbidity after adjusting for duration, a surrogate for severity. Our results demonstrate that clinicians should utilize the maneuver most likely to result in successful delivery.

Key words: neonatal morbidity, shoulder dystocia, shoulder dystocia maneuvers

Cite this article as: Spain JE, Frey HA, Tuuli MG, et al. Neonatal morbidity associated with shoulder dystocia maneuvers. *Am J Obstet Gynecol* 2015;212:353.e1-5.

Shoulder dystocia is an obstetric emergency that complicates 0.6-1.4% of vaginal deliveries.¹ Shoulder dystocia is defined as a delivery that

requires additional obstetric maneuvers following failure of gentle downward traction on the fetal head to effect delivery of the shoulders.¹ Several neonatal morbidities are associated with shoulder dystocia, including brachial plexus injury, humeral and clavicular fractures, hypoxic-ischemic encephalopathy, and even neonatal death.^{1,2}

Many obstetrical maneuvers have been described to relieve shoulder dystocia; the most commonly used maneuvers include McRoberts, suprapubic pressure, rotational maneuvers, and delivery of the posterior arm.³ Several previous studies have suggested that McRoberts and suprapubic pressure result in the lowest rate of neonatal morbidity and resolve 40-60% of shoulder dystocia events.⁴⁻⁶ Based on this evidence, American Congress of Obstetricians and Gynecologists (ACOG) recommends that McRoberts and suprapubic pressure be the initial maneuvers attempted in a shoulder dystocia.¹ While prior studies have shown increased risks of adverse

neonatal outcomes with use of additional maneuvers when compared with McRoberts and suprapubic pressure, none accounted for duration of shoulder dystocia.⁴⁻⁶ Further, there are few data on individual advanced maneuvers beyond McRoberts and suprapubic pressure and neonatal outcomes.

The objective of this study was to examine the independent effects of advanced maneuvers used in the management of shoulder dystocia as compared to McRoberts and suprapubic pressure alone on the risk of neonatal morbidity, accounting for duration, a surrogate for severity of dystocia.

MATERIALS AND METHODS

We conducted a retrospective cohort study of all women who experienced a clinically diagnosed shoulder dystocia requiring obstetric maneuvers at term (≥ 37 weeks) at a single tertiary care hospital from 2005 through 2008. We excluded women with a known major fetal anomaly, intrauterine death,

From the Department of Obstetrics and Gynecology, Washington University in St. Louis School of Medicine, St. Louis, MO.

Received Aug. 12, 2014; accepted Oct. 2, 2014.

H.A.F. is supported by training grant number 5 T32 HD055172-05 from the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development. A.G.C. is a Robert Wood Johnson Foundation Physician Faculty Scholar, which partially supports this work. This publication was supported by Washington University Institute of Clinical and Translational Sciences grant number UL1 TR000448.

The authors report no conflict of interest.

Presented in poster format at the 34th annual meeting of the Society for Maternal-Fetal Medicine, New Orleans, LA, Feb. 3-8, 2014.

Corresponding author: Janine E. Spain, MD. spainj@wudosis.wustl.edu

0002-9378/\$36.00

© 2015 Elsevier Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.ajog.2014.10.001>

multiple gestation, and preterm gestational age. This study was approved by the Washington University Human Research Protection Office.

The comparison groups were defined by exposure to a particular maneuver including McRoberts/suprapubic pressure only, Rubin maneuver, Wood's screw maneuver, or delivery of the posterior arm. Based on the ACOG recommendation that McRoberts and suprapubic pressure be the initial maneuvers attempted in a shoulder dystocia, we chose our reference group in this study to include all of those patients whose dystocia was resolved by McRoberts/suprapubic pressure alone. With the exception of the reference group, some women were exposed to >1 additional maneuver.

The primary outcome was a composite morbidity of neonatal injury and neonatal depression. We defined neonatal injury as the occurrence of clavicular or humeral fracture, or brachial plexus injury. Neonatal depression included any of the following: Apgar <7 at 5 minutes, arterial cord pH <7.1, continuous positive airway pressure use, intubation, or respiratory distress. Respiratory distress was defined as the requirement of oxygen support after 6 hours of life or any need for mechanical ventilation. Beyond those neonates delivered by McRoberts/suprapubic pressure only, neonatal morbidity was included under each maneuver to which the neonate was exposed.

Extensive data were extracted from the maternal and neonatal medical records to obtain sociodemographic information, medical and antenatal history, and neonatal outcomes. Data on the shoulder dystocia including duration of the shoulder dystocia defined as time from delivery of the fetal head to delivery of the fetal shoulders in seconds, and obstetric maneuvers performed were collected from a standardized delivery record. Baseline characteristics were compared between the reference group of McRoberts/suprapubic pressure only and women who required the use of an additional maneuver. Categorical variables were compared using the χ^2 or Fisher exact test, as appropriate.

Continuous variables were assessed for normality using Kolmogorov-Smirnov test. Variables that were not normally distributed were compared with the Mann-Whitney *U* test and normally distributed variables were compared using the Student *t* test. The relationship between number of advanced maneuvers utilized and duration of shoulder dystocia was secondarily explored.

Odds ratios (ORs) were calculated for the composite outcome comparing each of the exposure groups (delivery of posterior arm, Rubin maneuver, or Wood's screw maneuver) to the reference group (McRoberts/suprapubic pressure only). Logistic regression was used to control for confounding factors. A backward stepwise approach utilizing the likelihood ratio test to assess the impact of each covariate on the model was used. Duration of shoulder dystocia was included as a continuous variable in the model because there was a linear relationship between duration and morbidity as demonstrated by plotting the predicted probability of the composite outcome against time. The final model adjusted for nulliparity and duration of shoulder dystocia.

The relationship between duration of shoulder dystocia and risk of the composite morbidity was further assessed and presented visually by Kaplan-Meier curve. Differences in the duration of shoulder dystocia in pregnancies with and without the composite morbidity were compared using the log rank test.

All analyses were performed using Stata Special Edition 12.1 (StataCorp, College Station, TX).

RESULTS

Of 8390 deliveries in the study period, 231 met the inclusion criteria. Of those, 135 were delivered by McRoberts/suprapubic pressure alone (57.9%). In all, 83 women were exposed to Rubin maneuver, 53 were exposed to Wood's screw maneuver, and 36 were exposed to delivery of the posterior arm.

Women who were delivered by McRoberts/suprapubic pressure alone did not differ by parity, gestational age, prevalence of diabetes (either pregestational or gestational), rate of operative

vaginal delivery, or infant weight >4000 g as compared to women delivered using additional maneuvers (Table 1). However, women delivered by McRoberts/suprapubic pressure alone did have a significantly shorter duration of shoulder dystocia than women delivered by one of the other maneuvers with a median duration of 29 seconds (interquartile range, 29–30 seconds) as compared to 60 seconds (interquartile range, 40–90 seconds) (Table 1).

Secondarily, we explored the relationship between number of advanced maneuvers utilized and duration of dystocia. We found that the median duration of dystocia increased with the utilization of an increasing number of maneuvers ($P < .01$) (Table 2).

The neonatal morbidity composite occurred in 65 of the 231 patients (28.1%). The rate of neonatal morbidity was higher with additional maneuvers compared with McRoberts/suprapubic pressure alone (22.2% vs 50.0% for delivery of the posterior arm, 36.1% for Rubin maneuver, and 39.6% for Wood's screw maneuver). In unadjusted analysis, each type of additional maneuver appeared to be associated with an increased risk of the composite outcome relative to the reference group delivered by McRoberts/suprapubic pressure alone: relative risk (RR), 2.25 (95% confidence interval [CI], 1.42–3.54) for delivery of the posterior arm; RR, 1.63 (95% CI, 1.06–2.49) for Rubin maneuver, and RR 1.78 (95% CI, 1.13–3.03) for Wood's screw maneuver. However, after controlling for nulliparity and duration of shoulder dystocia, these differences were no longer statistically significant: adjusted OR (aOR), 1.77 (95% CI, 0.54–5.79) for delivery of the posterior arm; aOR, 1.36 (95% CI, 0.63–2.93) for Rubin maneuver; and aOR, 1.17 (95% CI, 0.45–3.03) for Wood's screw maneuver (Table 3).

Similarly, when we evaluated the components of the composite outcome separately as neonatal injury and neonatal depression, apparent positive associations between the adverse outcomes and exposure to additional maneuvers were not demonstrated after adjusting for parity and duration.

Download English Version:

<https://daneshyari.com/en/article/6144351>

Download Persian Version:

<https://daneshyari.com/article/6144351>

[Daneshyari.com](https://daneshyari.com)