Factors Associated with Trial of Labour and Mode of Delivery in Robson Group 5: A Select Group of Women With Previous Caesarean Section

Mila Smithies, MD;[1] Christy G. Woolcott, PhD;[1,2] Jo-Ann K. Brock, MD, PhD;[1] Bryan Maguire, MSc;[1,2] Victoria M. Allen, MD, MSc[1]

[1]Department of Obstetrics and Gynaecology, Dalhousie University, Halifax, NS

[2]Department of Pediatrics, Dalhousie University, Halifax, NS

Abstract

Objective: To determine the proportion of women in Robson group 5 (RG5) who were eligible for a trial of labour after Caesarean (TOLAC) and, among eligible candidates, identify determinants of having a TOLAC and subsequent vaginal delivery (VD).

Methods: This population-based cohort study used data derived from the Nova Scotia Atlee Perinatal Database. Deliveries from 1998–2014 to women in RG5 (≥1 previous CS with a singleton term cephalic fetus) were included. Eligibility for a TOLAC was based on SOGC criteria. Multivariable logistic regression was used to identify characteristics independently associated with TOLAC and VD. The characteristics associated with VD were used in a logistic model to predict the theoretical probability of VD in women who did not have a TOLAC.

Results: Of the 15 111 deliveries in RG5, 75.3% were by CS. Of the 14 763 eligible women, 5488 (37.2%) had a TOLAC, of which 3739 (68.1%) resulted in VD. Predictors of VD included high area–level income and either a CS without labour or a spontaneous VD in the preceding pregnancy. While mode of previous delivery also predicted TOLAC among eligible women, high area–level income was associated with reduced odds of TOLAC. The probability of VD in women who did not undergo TOLAC was estimated to be 47.1%, and the lowest CS rate attainable in RG5 was estimated at 46.3%.

Conclusions: Sociodemographic factors such as income and previous mode of delivery were associated with the rates of TOLAC and subsequent VD in eligible women, and suggest that the Caesarean section rate in RG5 could be safely reduced.

Key Words: Robson classification, trial of labour, vaginal birth after Caesarean section

Corresponding Author: Dr. Christy G. Woolcott, Departments of Obstetrics & Gynaecology and Pediatrics, IWK Health Centre, Halifax, NS. christy.woolcott@dal.ca

Competing interests: None declared.

Received on June 5, 2017

Accepted on October 24, 2017

Résumé

Objectif : Déterminer la proportion de femmes du groupe 5 de la classification de Robson (G5R) admissibles à un essai de travail après césarienne (TOLAC), et définir les déterminants du TOLAC et de l'accouchement vaginal (AV) subséquent présents chez ces femmes.

Méthodologie : Nous avons mené une étude de cohorte basée sur une population à l'aide de données tirées de la base de données périnatales Atlee de la Nouvelle-Écosse. Nous avons tenu compte des accouchements vécus entre 1998 et 2014 par des femmes du G5R (femmes ayant subi au moins une césarienne, enceintes d'un seul fœtus à terme en position céphalique). L'admissibilité des femmes au TOLAC a été déterminée selon les critères de la SOGC. Une régression logistique multivariée a servi à définir les caractéristiques indépendamment associées au TOLAC et à l'AV, et les caractéristiques associées à l'AV ont été utilisées dans un modèle logistique pour prédire la probabilité théorique d'AV chez les femmes n'ayant pas eu de TOLAC.

Résultats : Au total, 75,3 % des 15 111 femmes du G5R à l'étude ont accouché par césarienne. Parmi les 14 763 femmes admissibles, 5488 (37,2 %) ont fait un TOLAC; de ce nombre, 3739 (68,1 %) ont connu un AV. Les facteurs prédictifs d'AV comprenaient notamment un revenu régional élevé et une césarienne sans travail ou un AV spontané à la grossesse précédente. Par ailleurs, le mode d'accouchement de la grossesse précédente était un facteur prédictif de TOLAC chez les femmes admissibles, mais ce n'était pas le cas du revenu régional élevé, qui était plutôt associé à une probabilité réduite de TOLAC. La probabilité d'AV chez les femmes n'ayant pas eu de TOLAC a été estimée à 47,1 %, et le plus faible taux de césarienne atteignable chez les femmes du G5R a été estimé à 46,3 %.

Conclusions : Des facteurs sociodémographiques comme le revenu et le mode d'accouchement à la dernière grossesse ont été associés aux taux de TOLAC et d'AV subséquent chez les femmes admissibles; ils laissent en outre penser que le taux de césariennes pratiquées chez les femmes du G5R pourrait être réduit sans danger.

J Obstet Gynaecol Can 2018;■■(■■):■■–■■
https://doi.org/10.1016/j.jogc.2017.10.026

INTRODUCTION

Reasons for rising Caesarean section rates are multifactorial and influenced in part by changing maternal characteristics. Advanced maternal age and obesity are associated with medical comorbidities and multiple gestations, which are associated with higher rates of Caesarean section.[1,2] Changes in obstetric practice such as decreasing rates of operative vaginal delivery, vaginal breech delivery, and trial of labour after Caesarean (TOLAC) have also contributed to higher Caesarean rates.[2,3] Compared with vaginal deliveries, Caesarean sections have been associated with higher rates of maternal, fetal, and infant morbidity, and higher costs, especially when performed in labour.[4–6]

The 10-group (Robson) classification system is a standardized tool for monitoring Caesarean section rates.[7–9] The classification framework places women into one of ten mutually exclusive groups, based on parity, gestational age, plurality, fetal presentation, and previous Caesarean section.[10] Robson Group 5 (RG5) comprises multiparous women with an obstetric history that includes at least one previous Caesarean section and a current term, singleton, cephalic fetus.[7,10] International studies have identified this group as the largest contributor to the overall Caesarean section rate.[8,11–13] RG5 also includes the subset of women who are potential candidates for a vaginal birth after Caesarean section.[14]

Characterising the pregnancies of the select group of women who constitute RG5 is an essential first step in guiding future preventative strategies aimed at safely lowering Caesarean section rates and for understanding the degree to which they could be lowered.[15–17] The study used a comprehensive provincial, population-based, perinatal database to estimate the proportion of women in RG5 who were eligible for a TOLAC, to identify determinants for having a TOLAC and successful vaginal delivery, and to estimate the minimum rate of delivery by Caesarean section that could be observed if all eligible women in RG5 had a TOLAC.

ABBREVIATIONS

aOR	adjusted odds ratio
NSAPD	Nova Scotia Atlee Perinatal Database
RG5	Robson Group 5
TOLAC	trial of labour after Caesarean
uOR	unadjusted odds ratio
VD	vaginal delivery

METHODS

This population-based retrospective cohort study used data derived from the Nova Scotia Atlee Perinatal Database (NSAPD). This provincial clinically-oriented computerized database is accurate and reliable.[18,19] Maternal and newborn data (such as demographic variables, procedures, maternal and newborn diagnoses, and mortality information) are available for every delivery of an infant weighing more than 500 g or delivering at or after 20 weeks' gestation to residents of Nova Scotia since 1988. Included in the present study were deliveries from 1998 to 2014 to women meeting criteria for classification in RG5. Specifically, deliveries at greater than or equal to 37 weeks' gestational age, with a singleton infant in cephalic presentation to women who had had at least one previous delivery by Caesarean section were included. Deliveries in the study period with missing data on parity, gestational age, plurality, fetal presentation, or previous Caesarean section (3.2%) could not be classified into Robson groups. The Reproductive Care Program of Nova Scotia and the Research Ethics Board at the IWK Health Centre provided data access and ethics approvals. The Department of Obstetrics and Gynaecology at Dalhousie University provided funding for this project.

Eligibility for TOLAC was defined using Canadian criteria,[14] which are in line with international guidelines.[20,21] Women with any previous Caesarean section by inverted T, J, or classical uterine incision were ineligible, whereas those with an unknown scar were considered eligible, given that the majority of these cases were likely to be lower transverse incisions.[14] Women with a history of uterine surgery or rupture or placenta previa in the index pregnancy were not considered eligible for TOLAC.[14] The Robson classification is based on actual presentation at delivery. As such, deliveries of infants for which a Caesarean section was performed because they had been thought to be non-cephalic (based on recorded indication for Caesarean section) were also not considered eligible for TOLAC.[14] A TOLAC was defined as labour that occurred either spontaneously or following induction. Mode of delivery was defined as vaginal delivery or Caesarean section.

Pre-labour factors that were investigated in relation to the odds of undergoing a TOLAC and of having a vaginal delivery included sociodemographic characteristics (birth year, maternal age and weight at delivery, relationship status,