

Compliance With a Perinatal Prophylaxis Policy for Prevention of Venous Thromboembolism After Caesarean Section

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Abstract

Objective: To assess physician compliance, before and after a quality improvement intervention, with a regional policy on postpartum thromboprophylaxis following Caesarean section (CS), and to compare clinical outcomes (reduction of venous thromboembolism or increase in postpartum bleeding) between groups.

Methods: We performed a retrospective chart review of deliveries by CS, 404 prior to and 451 subsequent to a quality improvement intervention. All subjects were classified as being at either moderate or high risk for venous thromboembolism based on a risk-factor assessment, and warranted postpartum thromboprophylaxis according to the regional policy. Data regarding thromboembolism risk factors, postpartum thromboprophylaxis received, and clinical outcomes were recorded.

Results: Initial compliance with the regional policy was poor, but improved following the intervention. The use of intermittent pneumatic compression devices increased from 32% to 84% ($P < 0.001$), use of anticoagulation increased from 6.2% to 46% ($P < 0.001$), and full compliance with the policy increased from 1.7% to 30% ($P < 0.001$). Clinical outcomes were not significantly different between the groups.

Conclusion: A quality improvement intervention markedly increased physician compliance with a regional policy on postpartum thromboprophylaxis among women at moderate to high risk of venous thromboembolism after CS. Adverse clinical outcomes were infrequent in this small study population.

Résumé

Objectif : Évaluer l'observance des médecins, avant et après une intervention d'amélioration de la qualité, en ce qui concerne une politique régionale portant sur la thromboprophylaxie postpartum à la suite d'une césarienne (CS), et comparer les issues cliniques (diminution de l'incidence de la thromboembolie veineuse ou augmentation des saignements postpartum) d'un groupe à l'autre.

Méthodes : Nous avons mené une analyse de dossiers rétrospective portant sur les accouchements par césarienne (404 cas avant la tenue d'une intervention d'amélioration de la qualité et 451 cas après la tenue d'une telle intervention). Toutes les patientes étaient classées comme courant un risque modéré ou élevé de thromboembolie veineuse en fonction des résultats d'une évaluation des facteurs de risque, ce qui justifiait la mise en œuvre d'une thromboprophylaxie postpartum conformément à la politique régionale. Les données concernant les facteurs de risque de thromboembolie, la thromboprophylaxie postpartum administrée et les issues cliniques ont été consignées.

Résultats : D'entrée de jeu, la politique régionale n'était pas bien respectée; cependant, la situation s'est améliorée à la suite de l'intervention. L'utilisation de dispositifs de compression pneumatique intermittente est passée de 32 % à 84 % ($P < 0,001$), l'utilisation d'anticoagulants est passée de 6,2 % à 46 % ($P < 0,001$) et l'application intégrale de la politique est passée de 1,7 % à 30 % ($P < 0,001$). Les issues cliniques ne se sont pas avérées significativement différentes d'un groupe à l'autre.

Conclusion : La tenue d'une intervention d'amélioration de la qualité a entraîné une hausse marquée de l'observance des médecins envers une politique régionale sur la thromboprophylaxie postpartum chez les femmes qui courent un risque allant de modéré à élevé de thromboembolie veineuse à la suite d'une césarienne. Les issues cliniques indésirables étaient peu fréquentes au sein de cette petite population d'étude.

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INTRODUCTION

Venous thromboembolism is a major cause of maternal morbidity and mortality in North America^{1–4} and the United Kingdom,⁵ with most fatal events occurring during the postpartum period.^{6,7} Delivery by CS is associated with a further increase in maternal thrombotic risk, resulting in a higher incidence of venous thromboembolism.^{8–10} While the risk of thromboembolic disease in unselected women post-CS is low and does not justify routine thromboprophylaxis,^{11,12} selected women with additional risk factors are at higher risk and may benefit from such precautionary treatment.^{13,14} Risk factors include obesity, age over

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35 years, a history of prior thromboembolic event, the presence of an acquired or inherited thrombophilia, parity greater than three, the presence of varicose veins, concurrent infection or illness, gestational hypertension, prolonged antepartum immobility, and emergency CS during labour.^{15,16} The risk of thromboembolism following CS increases with the presence of multiple risk factors. The Royal College of Obstetricians and Gynaecologists in the United Kingdom has recommended that a risk-factor assessment be made at the time of delivery, with thromboprophylaxis targeted towards women with higher risk, i.e., those having one or more risk factors.⁷ The RCOG suggested that thromboprophylaxis include low-dose anticoagulation with low molecular weight heparin, the use of intermittent pneumatic compression devices, or both, coupled with early hydration and mobilization.¹⁷

The Calgary Health Region developed and implemented a regional policy on thromboprophylaxis following CS in 2002, in accordance with the RCOG recommendations. The policy was subsequently advertised and distributed to all members of the Department of Obstetrics and Gynaecology, University of Calgary. Shortly thereafter, physicians within the department raised concerns regarding their compliance with the policy. A quality assurance audit to evaluate compliance was then performed, utilizing a retrospective chart review, evaluating the nine months immediately following policy implementation. A quality improvement intervention was subsequently developed. The QII included additional education directed at physicians, house staff, and nursing staff regarding the policy; a computerized order set to facilitate the ordering of thromboprophylaxis; and a risk-factor checklist with directed thromboprophylaxis (by risk status), to be completed by nursing staff at the time of CS and brought to the attention of the responsible physician. Compliance with the regional policy was subsequently re-evaluated.

The primary objective of this study was to determine if the QII would improve overall physician compliance with the policy. The secondary objective was to evaluate patient outcomes based on thromboprophylaxis received (i.e., any

reduction of VTE events or increase in bleeding complications related to the use of anticoagulants post partum).

MATERIALS AND METHODS

We retrospectively reviewed the medical records of women who underwent Caesarean section at the Foothills Medical Centre (Calgary, Alberta) between April 1, 2002, and December 31, 2002 (prior to the QII), and between April 1, 2004, and December 31, 2004 (following the QII). The QII included a didactic educational session for obstetricians and resident house staff, in-service training for nurses provided by nursing managers, and educational posters placed throughout the labour, delivery, and postpartum wards. Educational efforts focused on the regional policy itself, general information about venous thromboembolism in pregnancy, information about safety including risks and benefits of low molecular weight heparin, and an introduction to the QII checklist and its use. The checklist was designed to assess patient risk factors for thromboembolic disease rapidly and to direct clinicians to the appropriate prophylactic strategy based on the number and type of risk factors. The checklist was integrated into the mandatory paperwork that nursing staff must complete prior to a patient undergoing CS. According to the checklist, if a patient qualified for thromboprophylaxis in the form of intermittent PCS, anticoagulation or both, the nurse would notify the attending physician or house staff. To facilitate ordering of the appropriate prophylactic strategy, a simple computerized set of orders was created for clinicians. Individual physician compliance was not assessed during the study. Attendance at educational sessions was strongly encouraged but not enforced. The regional policy and QII were very well received by physicians, residents, and nursing staff.

Foothills Medical Centre is a tertiary care referral hospital with approximately 4400 deliveries annually. Utilizing the Calgary Health Region corporate database, a study population of women at moderate to high risk for venous thromboembolism was identified, based on the presence of risk factors including age (> 35 years), obesity (weight > 80 kg), and parity > 3, and using the International Classification of Diseases (10th revision) discharge diagnosis codes for previous thromboembolic event, known hypercoagulable state, preeclampsia, and other venous complications (Table 1). All women with at least one identified risk factor were included over the two study periods of April–December 2002 (n = 404) and April–December 2004 (n = 451). Cases were excluded only if there was no accessible health record. The regional database was also reviewed for adverse postpartum outcomes among subjects, including venous thromboembolism, thrombophlebitis, and postpartum hemorrhage (defined as bleeding that results in signs or

ABBREVIATIONS

CI	confidence interval
CS	Caesarean section
PCS	pneumatic compression stockings
QII	quality improvement intervention
RCOG	Royal College of Obstetricians and Gynaecologists
VTE	venous thromboembolism

Table 1. ICD-10-CA* Codes used for selection of moderate- and high-risk cases

ICD-10-CA Classification Codes	Description
Previous venous thromboembolism	
Z86.70	Personal history of thromboembolic disease
Hypercoagulability	
D68.80	Inherited hypercoagulable states
D68.81	Acquired hypercoagulable states
D68.88	Other specified coagulation defects
D68.9	Coagulation defect, unspecified
Preeclampsia	
O13.001 and O13.002	Gestational hypertension without proteinuria
O14.001 and O14.002	Gestational hypertension with proteinuria
Other venous complications	
O22.001	Varicose veins of lower extremity in pregnancy
O22.201	Superficial thrombophlebitis in pregnancy

*The Canadian Enhancement of ICD-10, International Statistical Classification of Diseases and Related Health Problems, 10th Revision. Ottawa: Canadian Institute for Health Information; 2001.

symptoms of hemodynamic instability) presenting at any regional site (including two additional community hospitals and one urgent care ambulatory clinic) and occurring within three months of delivery. The Adult Research Committee of the Calgary Health Region and the Conjoint Health Research Ethics Board of the Faculty of Medicine at the University of Calgary gave approval for the study.

The medical records of all subjects were reviewed for evidence of prior maternal thromboembolism, maternal thrombophilia, a maternal family history of thrombophilia or thromboembolism, maternal risk factors associated with increased risk of thromboembolism (below), evidence of infection (maternal fever or leukocytosis, or maternal or fetal tachycardia), maternal medical comorbidity, administration and dose of postpartum anticoagulants received (low-molecular-weight heparin, unfractionated heparin, or both), use of intermittent pneumatic compression devices, and postpartum outcomes (VTE events or bleeding complications). Maternal risk factors included age over 35 years, weight over 80 kg, parity over 3, varicose veins, concurrent infection or illness, gestational hypertension, immobility for more than four days, and emergency CS during labour. Women were classified as “moderate risk” if one or two risk factors were present, and “high risk” if three or more risk factors were present. Women with a personal or family history of venous thromboembolism were considered to be at high risk. Lastly, each case was reviewed for compliance with the regional policy. All women at moderate and high risk were assigned to receive intermittent pneumatic compression devices for 24 hours, commencing preoperatively or immediately postoperatively, plus dalteparin (2500 IU

for women at moderate risk or 5000 IU for those at high risk) administered by daily subcutaneous injection until discharge (the average hospital stay was for three days).

Statistical analysis was performed using STATA 9.0 (Stata Corporation, College Station, TX). Bivariate analysis of our comparison groups was done using the analysis of variance (ANOVA) test for continuous variables and chi-square analyses for dichotomous variables. Logistic regression analysis was used to determine the odds ratio for compliance with the regional policy for each maternal VTE risk factor. A *P* value of less than 0.05 was considered statistically significant. Sample size was calculated with the assistance of PS Power and Sample Size Calculations Version 2.1.3.¹⁸ We predicted a baseline compliance with the regional policy of approximately 5% prior to the QII (based on a limited random chart review), with an anticipated doubling of full compliance (to 10%) and greater increases in the use of any thromboprophylaxis post partum following the QII. To detect this difference with an alpha of 0.05 and a power of 0.9, at least 310 patients would be required in each comparison group for an adequate two-sided analysis.

RESULTS

Between April 1 and December 31, 2002, a total of 3215 women delivered, 786 of those by Caesarean section (24.4%). Of these women, 413 (52.5% of those delivering by CS) were identified as being at moderate or high risk via our selection method utilizing the Calgary Health Region corporate database. Nine were excluded from review because their charts were not immediately available, resulting in a sample size of 404 women (51.4% of the CS group).

Table 2. Maternal demographic characteristics of study groups pre- and post-QII

Characteristic	Pre-QII (2002) n = 404	Post-QII (2004) n = 451
Age (years)	33.5 (33.04–34.05)	34.1 (33.54–34.61)
Parity	1.0 (0.85–1.10)	0.8 (0.69–0.90)
Weight (kg)	86.8 (84.69–88.97)	85.2 (83.55–86.92)
Body mass index	31.8 (31.06–32.57)	31.7 (31.10–32.27)
Gestational hypertension (HELLP syndrome, PIH, preeclampsia)	21.5% (17.42–25.44)	26.6% (22.50–30.70)
Varicose veins	1.2% (0.15–2.31)	0.7% (-0.09–1.42)
Major illness*	24.2% (20.01–28.39)	29.6% (25.32–33.79)
Antepartum immobility > 4 days	10.6% (7.59–13.60)	6.4% (4.16–8.70)
Emergency Caesarean section during labour†	63.3% (58.59–68.01)	51.7% (47.03–56.29)
Maternal thrombophilia‡	1.5% (0.30–2.66)	3.8% (2.00–5.53)
Prior maternal or family history of thromboembolism	1.5% (0.30–2.68)	2.7% (1.18–4.17)
Moderate risk	53.7% (48.83–58.60)	51.0% (46.37–55.63)
High risk	46.3% (41.40–51.17)	49.0% (44.37–53.63)

HELLP: hemolysis, elevated liver enzymes, low platelets; PIH: pregnancy-induced hypertension.

The data are given as mean (95% CI) or percentage (95% CI).

*Major illness defined as any concurrent, active disease affecting single or multi-organ system.

† $P < 0.05$ between study periods, all other comparisons $P > 0.05$

Similarly, during the period from April to December 2004, a total of 3333 women delivered, 948 (28.4%) of whom delivered by CS and 451 of whom (47.6% of the CS group) we identified as being at moderate or high risk. All subjects had available medical records during the latter period.

Maternal demographics and characteristics for both the 2002 and 2004 study groups are shown in Table 2. The subjects had a combined mean age of 33.8 years (95% CI 33.45–34.20). There was an overall tendency to obesity, with a mean weight of 85.9 kg (95% CI 84.64–87.33), and the combined sample had a high prevalence of gestational hypertension (24.1%; 95% CI 21.28–27.03). The two study groups were similar with the following exceptions: there was a higher prevalence of emergency CS during labour in the 2002 group (63.6% vs. 51.7%, $P < 0.05$) and a higher prevalence of maternal thrombophilia in the 2004 group (1.5% vs. 3.8%, $P < 0.05$). The study groups contained an equivalent distribution of women at moderate and high risk.

Physician compliance with the regional policy in 2002, following initial introduction of the regional thromboprophylaxis policy but prior to the QII, was low but improved slightly over the nine-month period of study. The trend to increasing full compliance with the regional policy over these successive three-month intervals was similar in

both moderate- and high-risk groups (0%–2.5%–1.7% and 0%–1.6%–3%, respectively).

The data regarding factors affecting use of thromboprophylaxis are shown in Table 3. Not surprisingly, the presence of a maternal thrombophilia was a very strong predictor of prophylaxis (full compliance with regional policy, OR 37.7; any use of anticoagulation, OR 82.1; and PCS use, OR 5.6), as this is a widely recognized risk factor for VTE. The other major predictor of thromboprophylaxis was the introduction of the QII (as reflected by period of study): OR 33.0 for compliance with regional policy, OR 22.1 for any anticoagulation, and OR 11.6 for PCS use. Other significant factors for compliance are listed in Table 3.

Following implementation of the QII (2004), physician use of postpartum thromboprophylaxis including compliance with the regional policy, any anticoagulation, and PCS use improved dramatically, as illustrated in the Figure.

The prevalence of adverse postpartum clinical outcomes was low among all subjects. Venous thromboembolism (3 women with deep venous thrombosis and 2 women with pulmonary embolism) had an overall prevalence of 0.6%, no women developed thrombophlebitis, and 2.7% (23 women) had postpartum hemorrhage. There was no difference in postpartum outcomes (thromboembolism

Table 3. Factors affecting use of thromboprophylaxis (n = 855)

Factors studied	Odds Ratio (95% CI)		
	Full compliance	Any use of postpartum anticoagulation	Use of PCS
Period following QII	33.0 (13.2–82.5)*	22.1 (12.2–39.9)*	11.6 (8.1–16.7)*
Age (years)	1.0 (0.9–1.1)	1.0 (1.0–1.1)*	1.1 (1.0–1.1)*
Parity	1.0 (0.8–1.2)	1.0 (0.9–1.2)	0.9 (0.8–1.0)
Weight (kg)	1.0 (0.9–1.0)	1.0 (0.9–1.0)	0.9 (0.9–1.0)
Body mass index	1.1 (1.0–1.2)	1.0 (0.9–1.1)	1.1 (1.0–1.2)*
Gestational hypertension (HELLP syndrome, PIH, preeclampsia)	0.7 (0.4–1.2)	0.8 (0.5–1.3)	0.9 (0.6–1.4)
Varicose veins	0.9 (0.1–10.4)	4.8 (0.6–35.9)	0.5 (0.1–3.3)
Major illness†	0.5 (0.3–0.9)	1.2 (0.7–1.8)	1.1 (0.7–1.6)
Antepartum immobility > 4 days	0.7 (0.2–1.9)	1.8 (0.9–3.8)	0.7 (0.4–1.4)
Emergency CS during labour	0.7 (0.5–1.1)	1.5 (1.0–2.3)*	1.2 (0.8–1.7)
Maternal thrombophilia	37.7 (6.7–212.8)*	82.1 (12.8–525.8)*	5.6 (1.1–28.1)*
Prior maternal or family history of thromboembolism	0.5 (0.04–5.4)	0.2 (0.03–2.1)	0.5 (0.1–2.5)

HELLP: hemolysis, elevated liver enzymes, low platelets; PIH: pregnancy-induced hypertension.
 * $P < 0.001$
 †Major illness defined as any concurrent, active disease affecting single or multi-organ system.

and postpartum hemorrhage) between the 2002 and 2004 study groups, whether they received anticoagulants (n = 231) or did not receive anticoagulants (n = 624).

DISCUSSION

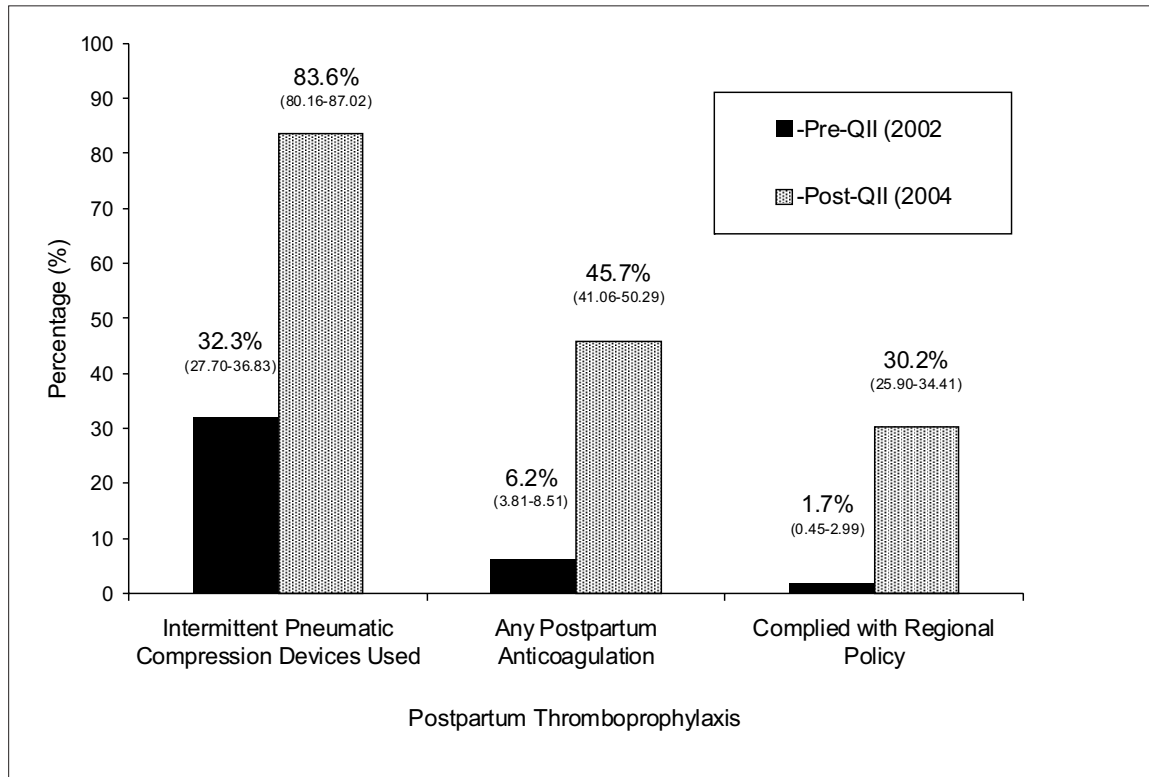
This study describes very poor initial physician compliance with a regional policy on thromboprophylaxis following CS, with markedly improved compliance following implementation of a simple quality improvement intervention. Compliance with the policy following initial roll-out (paper and electronic distribution and discussion at departmental meetings) was very low at less than 2%, but increased to 30% after institution of the QII. This improvement, greater than 15-fold, represents a dramatic change in health care behaviour and suggests that the QII undertaken was powerful. Interestingly, several of the involved local obstetric physicians were clearly aware of the policy details (and of their non-compliance) prior to the QII, and approached the investigators seeking a process solution. This supports the notion that for best practice to occur, knowledge must be supplemented by processes which support good decision-making.

Although compliance with the regional policy increased dramatically following institution of the QII, overall full compliance over the period of study was only 30%. One

possible reason for this less-than-expected increase includes disagreement by some obstetricians with the need for thromboprophylaxis following CS, with resistance to following the risk-factor based guidelines. Although expert opinion supports thromboprophylaxis for women at increased risk following CS, there are no published randomized controlled trials to date proving its merit. Another possible reason for non-compliance is poor communication between the nurses and physicians, as well as between the delivery and postpartum wards, with respect to the implementation of thromboprophylaxis. As the risk factor checklist was a new document, there was some confusion during the study regarding appropriate placement of the form in the medical record. Although efforts were made to clarify this issue, it is apparent that the placement of the checklist in the chart was inconsistent. In the future, consistent placement of the checklist within the medical record would facilitate clinical communication.

Our data indicate that physicians in our health region are more likely to use intermittent pneumatic compression devices than anticoagulants for postpartum thromboprophylaxis. This might indicate apprehension about possible hemorrhagic complications of anticoagulants, unfamiliarity with the dosing of the anticoagulants, or a process issue (because nursing staff are able to initiate the use

Physician compliance characteristics to the Calgary Health Region policy on thromboprophylaxis following Caesarean section prior to and following a QII.



The black bars represent the percentage compliance for each characteristic (95% CI) collected pre-QII in 2002 ($n = 404$), while the grey bars represent those collected post-QII in 2004 ($n = 451$). There was a significant improvement in compliance from 2002 to 2004 for each characteristic ($P < 0.001$).

of pneumatic compression stockings but not of anticoagulants). Factors shown to be important with respect to the use of PCS included increased age, increased body mass index, and most of all, the presence of a known maternal thrombophilia. Pneumatic compression devices have been shown to be virtually free of any clinically important side effect, to prevent venous stasis by enhancing venous blood flow in the legs, and to reduce the incidence of venous thrombosis in some surgical patients.¹⁹⁻²¹ Unfortunately, because these stockings are uncomfortable, patient compliance with wearing similar devices has been shown to be poor,²² and there are no studies evaluating their efficacy in pregnancy.

Anticoagulants, such as unfractionated heparin or low-molecular-weight heparin, are used for treatment and prophylaxis of venous thromboembolism during pregnancy. A systematic review of 81 studies concerning thromboprophylaxis and treatment with low-molecular-weight heparin in pregnancy found a low incidence of adverse effects.²³ Postpartum thromboprophylaxis with low-molecular-weight heparin was shown to be safe and effective, with no increased incidence of postpartum hemorrhage, heparin-induced thrombocytopenia, or loss of bone mineral

density.²³ Our obstetric care providers may be reassured by the fact that we did not identify any increase in hemorrhagic complications among our subjects despite a significant increase in the use of postpartum anticoagulants (from 6% to 46%) following the quality improvement intervention. For optimal thromboprophylaxis among women at increased risk, we support the combined use of intermittent pneumatic compression devices (intrapartum and in the early postoperative period, when patients are unable to ambulate, for up to a total of 24 hours) with the addition of prophylactic anticoagulation once the risk of bleeding is negligible (≥ 6 hours post partum). This combination confers protection throughout the entire peripartum interval. Among patients at high risk of postoperative bleeding, the initiation of anticoagulants may be delayed and physical measures continued.

Our data show that the presence of a maternal thrombophilia conferred the highest odds for compliance with the regional policy on post-CS thromboprophylaxis. This is not surprising, since many in this small population of women would have already been on prophylactic anticoagulant therapy during their pregnancy, and the decision regarding continuation of anticoagulants postpartum would

typically have been made prior to delivery. Thrombophilic women who were not anticoagulated antepartum would also typically have been advised to receive anticoagulants post partum, as per current expert guidelines.²⁴ There was also a disparity in the number of women with known thrombophilia in the first and second periods of study, with more thrombophilic women in the latter group. Despite this difference, the multivariate analysis showed that the use of the QII was a major independent factor in improving compliance with the regional policy.

The thromboembolic event rate in our population was low (< 1%), but consistent with other North American studies.^{1-4,6,8,14,22} Because of the low number of thromboembolic events occurring within our two study groups, there was no significant difference in thromboembolic outcomes between the 2002 and 2004 groups, despite a significant increase in use of thromboprophylaxis. Our sample size was too small to compare outcomes of such low frequency, and a much larger study would be required to detect a difference in incidence of these infrequent (but often serious) adverse clinical outcomes. We also may have failed to capture some postpartum clinical events. Our study design enabled us to review outcome data related to in-hospital events and return visits to regional hospitals and one urgent-care clinic. Women with thromboembolic events who may have presented to other primary-care clinics or hospitals in other health regions would not have been included in our outcome analysis.

Our study demonstrated no difference in the prevalence of postpartum hemorrhage with or without anticoagulation (low-molecular-weight heparin or unfractionated heparin). We may have been unaware of some postpartum bleeding events for the reasons noted. We also did not include wound hematoma as one of our outcome measures; it is possible that minor bleeding, bruising, and wound hematomas might be more common among women who received postpartum anticoagulants.

There are several other limitations to our study. First, we selected a quality improvement method utilizing a risk-factor checklist included in the "C-section package" of forms completed by nursing staff prior to CS, because we felt that this would maximize use of the instrument. We did not, however, have any means to ascertain the rate of use of the checklist. Since medical record organization within the Calgary Health Region did not allow for consistent placing of the completed form in the health record, we do not know how many forms were used as opposed to misplaced or discarded. We were also unable to assess the frequency with which the recommended management (per the checklist)

was brought to physician attention by the nursing staff member who completed the form.

Our initial case selection using the regional corporate database permitted rapid generation of sample populations, in which all subjects were at either moderate or high risk for venous thromboembolism. A limitation with this methodology was that not all risk factors for thromboembolism were included in the database. This resulted in populations in which certain risk factors were over-represented, while other risk factors may have been missed. For example, the presence of varicose veins was not identified for the database search, and because this was rarely reported in the medical records, the prevalence reported in our study population was extremely low. Conversely, the prevalence of maternal hypertensive disorders was considerably higher among our subjects than in general obstetric populations undergoing CS.^{25,26} To the extent that thromboembolism risk may vary by risk factor, this may have affected the prevalence of clinical outcomes among our study population.

Lastly, by the time of the second period of evaluation (2004), approximately two years had passed since implementation of the regional thromboprophylaxis policy. Some of the observed improvement in physician compliance during the second study period, therefore, may have been due to the dissemination of information regarding the policy over time (rather than an effect of the QII itself). This was demonstrated to a minor extent during the three 3-month intervals in 2002, over which full compliance increased slightly with increased time from regional policy implementation.

CONCLUSION

The use of thromboprophylaxis in women at increased risk for thrombosis following Caesarean section remains a debated topic. The Calgary Health Region's policy on thromboprophylaxis following CS approximates similar policies in the United Kingdom, but is uncommon among North American centres. With a simple quality improvement intervention we have markedly improved adherence to the regional policy, and further efforts to improve physician compliance may be warranted. Additional study of similar patients, with larger sample sizes and improved methodology to detect clinical outcomes, may be indicated to further define both the effectiveness of thromboprophylaxis as well as its economic implications.

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