Thromboprophylaxis for Women Undergoing Caesarean Section

Abstract:

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Abstract
Thromboprophylaxis for women undergoing caesarean section (CS) was introduced in the hospital in 1995. This study audited the use of tinzaparin prophylaxis in a nested cohort of women who screened negative for diabetes mellitus at 28 weeks gestation. All the women had their weight measured and BMI calculated at the first antenatal visit. Of the 284 women, 68 (24%) had a CS and all received tinzaparin. Of the 68, however, 94% received a dose lower than recommended. Compliance with prophylaxis was complete but compliance with the recommended dosage was suboptimal, which may result in venous thromboembolism after CS despite thromboprophylaxis.

Introduction
In developed countries, pulmonary embolism remains a leading cause of maternal death.[1,2] An important risk for venous thromboembolism (VTE) is caesarean section (CS) particularly if the woman has been immobilised. The most recent guidelines from the Royal College of Obstetricians and Gynaecologists (RCOG) recommends thromboprophylaxis for women undergoing CS.[3] While there is scant scientific evidence to underpin it, the guideline also recommends basing the dosage on a womanâ s weight at her first antenatal visit.[3] In 1995, thromboprophylaxis with subcutaneous tinzaparin 3,500 IU daily was introduced for all women undergoing CS in the hospital, unless there was a contraindication, such as haemorrhage. However, the practice of weighing women during antenatal care had been previously discontinued. It was reintroduced in 2008 in the light of emerging concerns about maternal obesity.[2] The purpose of this nested cohort study was to examine compliance with the 2009 RCOG guidelines in women undergoing CS.

Methods
Between July 2008 and June 2010, a prospective observational study was conducted examining the relationship between maternal body composition and fetal growth measured using ultrasound.[4] Women were enrolled at their convenience after screening with a Glucose Tolerance Test (GTT) excluded Gestational Diabetes Mellitus. To minimise confounding variables the study was confined to white European women with a singleton pregnancy. All the women had their weight and height measured in early pregnancy, and Body Mass Index calculated. Clinical and sociodemographic details were recorded prospectively and the woman was discharged back to her own obstetrician for the management of pregnancy and delivery. The delivery and medication details were obtained retrospectively from the medical records. The women studied gave written consent and the study was passed by the Hospitalâ s Research Ethics Committee.

Results
Of the 284 patients enrolled, 97 (34%) were in the normal BMI category, 85 (30%) were overweight and 102 (36%) were obese based on a BMI > 29.9 kg/m[2]. The BMI of the study group was higher than the hospital population because > 90 kgs was an indication for a GTT in the hospital. The caesarean section rate was 24% (n=68) and all these women received tinzaparin in compliance with hospital policy. However, 88% (n=60) received only 3500 IU, 10% (n=7) received 4500 IU, one received a therapeutic dose and none received 7,000 IU. Only 6% (n=4) of the women received the dose recommended in the RCOG guidelines and these women were in the obese BMI category. Table 1 shows a linear decrease between maternal weight in early pregnancy and the weight-adjusted dose of tinzaparin.

Discussion
We found that in women undergoing caesarean section compliance with hospital policy on thromboprophylaxis was complete. This is in contrast with a study of 240 women where only 17% of 200 eligible women undergoing CS received thromboprophylaxis.[5] The results were similar to other international studies where thromboprophylaxis was based on risk assessment at the time of operation.[6] However, while compliance with medication administration was complete, it is a concern that only 6% of the women in our study received the optimum dose of tinzaparin according to the most recent international guidelines. This may explain individual case reports of pregnant women developing VTE despite thromboprophylaxis.

Obese women are more likely to require delivery by caesarean section, and there is also evidence that obese women have a higher rate of maternal death.[7,8] In a study of women with moderate to severe maternal obesity, the dose of low molecular weight heparin (LMWH) was less than recommended in 85% antenatally and 84% postnatally.[2] While studies on the pharmacokinetics of LMWH are few, the recommendations are that dosage should be based on weight at the first visit, not BMI.[2,9] This means that all maternity units need to weigh women accurately in early pregnancy, and thus remove uncertainties about the correct dose of heparin around the time of delivery. In developed countries VTE is an important and preventable cause of maternal death.[10] The reintroduction of maternal weight measurements into antenatal care in Ireland affords an opportunity to improve the effectiveness of thromboprophylaxis administration in our obstetric practices.

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Comments: