

The association between maternal body mass index, postpartum haemorrhage and need for uterotonic or surgical treatment: a retrospective cohort study

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BACKGROUND

Maternal obesity is now considered the most common risk factor for adverse outcomes in obstetrics. Almost half of the women who gave birth in Australia in 2014 were overweight or obese.¹

METHODS

This was a retrospective cohort study of 22,163 singleton pregnancies that presented in spontaneous labour at term and delivered at three hospitals in Melbourne, Australia from 2012 to 2016. The study cohort was stratified into six groups according to the World Health Organization's BMI classifications.

RESULTS

The median EBL was significantly higher among women with obesity classes II and III compared to normal BMI women ($p=0.001$ and $p=0.042$, respectively). The occurrence of PPH was significantly higher in obese women and remained significant after adjusting for mode of delivery and other known risk factors for PPH. Raised BMI was significantly associated with an increased number of pharmacological therapies and the total number of treatments (Spearman's $\rho=0.026$ for both, $p<0.001$).

AIMS

The primary aim of this study was to determine the association between maternal BMI and the occurrence of PPH. The secondary outcome was to investigate the quantity of uterotonic use and rates of additional procedures required in the management of PPH in women with raised BMI.

DISCUSSION

Our findings are consistent with a number of other studies in the literature.²⁻⁸ There is minimal evidence regarding the association between maternal BMI and amount of uterotonics used or rates of additional procedures required. This is the first study to directly investigated the relationship between obesity and increased management requirements of PPH. All women should have a BMI recorded at booking. Maternal BMI should be considered when planning setting of delivery and there should be increased preparation for PPH including active management of third stage and early administration of uterotonics or transfer to theatre. Further research is needed to determine whether the current standard choice of uterotonics, their doses and method of delivery are adequate for women with a higher BMI.

BMI	Classification
< 18.5	underweight
18.5–24.9	normal weight
25.0–29.9	overweight
30.0–34.9	class I obesity
35.0–39.9	class II obesity
≥ 40.0	class III obesity

Table 1. Postpartum bleeding characteristics and treatment in different body mass index (BMI) groups.

	BMI (kg/m ²)					
	< 18.5 (n=828)	18.5–24.9 (n=11,909)	25.0–29.9 (n=5,919)	30.0–34.9 (n=2,241)	35.0–39.9 (n=800)	≥ 40 (n=466)
EBL (mL), Mean (95% CI)	368 (348–388)	394 (388–400)	397 (389–406)	414 (400–429)	445 (416–474)	458 (422–493)
PPH > 500 mL	129 (15.6)	2,111 (17.7)	1,051 (17.8)	436 (19.5)*	184 (23.0)*	112 (24.0)*
PPH ≥ 2000 mL	7 (0.8)	82 (0.7)	48 (0.8)	23 (1.0)	15 (1.9)*	5 (1.1)
Additional uterotonics	186 (22.5)	3073 (25.8)	1590 (26.9)	664 (29.6)*	285 (35.6)*	200 (42.9)*
Oxytocin infusion	119 (14.4)	2083 (17.5)	1126 (19.0)	474 (21.2)*	209 (26.1)*	138 (29.6)*
Ergometrine	20 (2.4)	414 (3.5)	200 (3.4)	88 (3.9)	45 (5.6)*	20 (4.3)*
Misoprostol	41 (5.0)	773 (6.5)	422 (7.1)	161 (7.2)	83 (10.4)*	52 (11.2)*
Intramyometrial PGF2-α	1 (0.1)	19 (0.2)	13 (0.2)	7 (0.3)	4 (0.5)	1 (0.2)
Tranexamic acid	0	0	3 (0.1)	0	0	0
Bakri® balloon	2 (0.2)	22 (0.2)	10 (0.2)	3 (0.1)	3 (0.4)	2 (0.4)
B-Lynch Suture	0	1 (0.1)	2 (0.1)	0	0	0
Arterial ligation or embolization	0	0	2 (0.1)	0	0	0
Postpartum hysterectomy	0	3 (0.1)	1 (0.1)	0	0	0
> One additional treatment	73 (8.8)	1247 (10.5)	625 (10.6)	246 (11.0)	129 (16.1)*	68 (14.6)*
Advanced treatment	3 (0.4)	33 (0.3)	20 (0.3)	9 (0.4)	6 (0.8)	3 (0.6)
Blood transfusion	16 (1.9)	235 (2.0)	85 (1.4)	29 (1.3)	14 (1.8)	11 (2.4)

Data given in absolute number (percentage). EBL: Estimated blood loss; CI: Confidence interval; PPH: Postpartum haemorrhage; PG2-α: Prostaglandin 2 alpha
* $p < 0.05$ when compared to normal BMI group; Fisher's Exact test for comparisons of categorical variables between the groups;

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