

The impact of maternal hypotension on umbilical arterial pH after caesarean delivery under spinal anesthesia; a retrospective cohort study.

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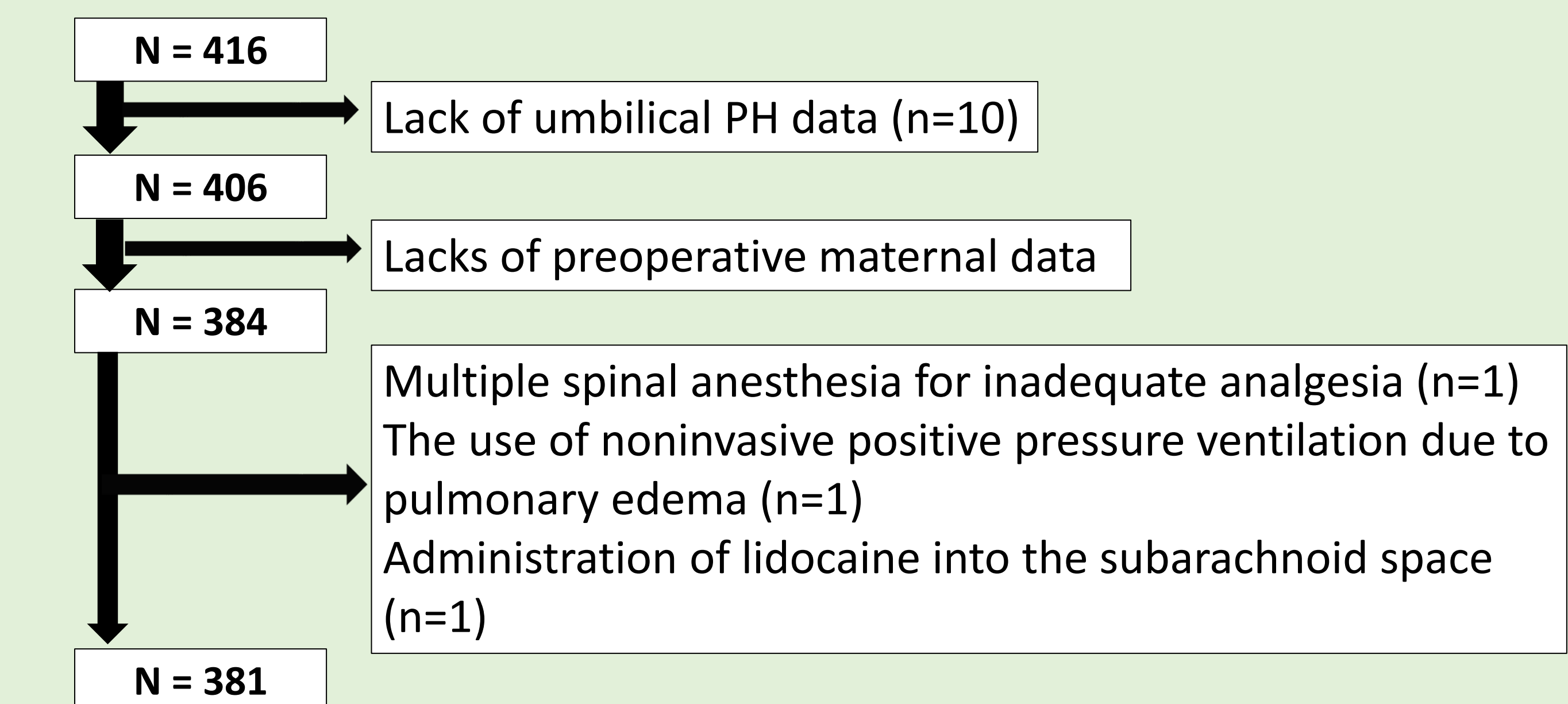
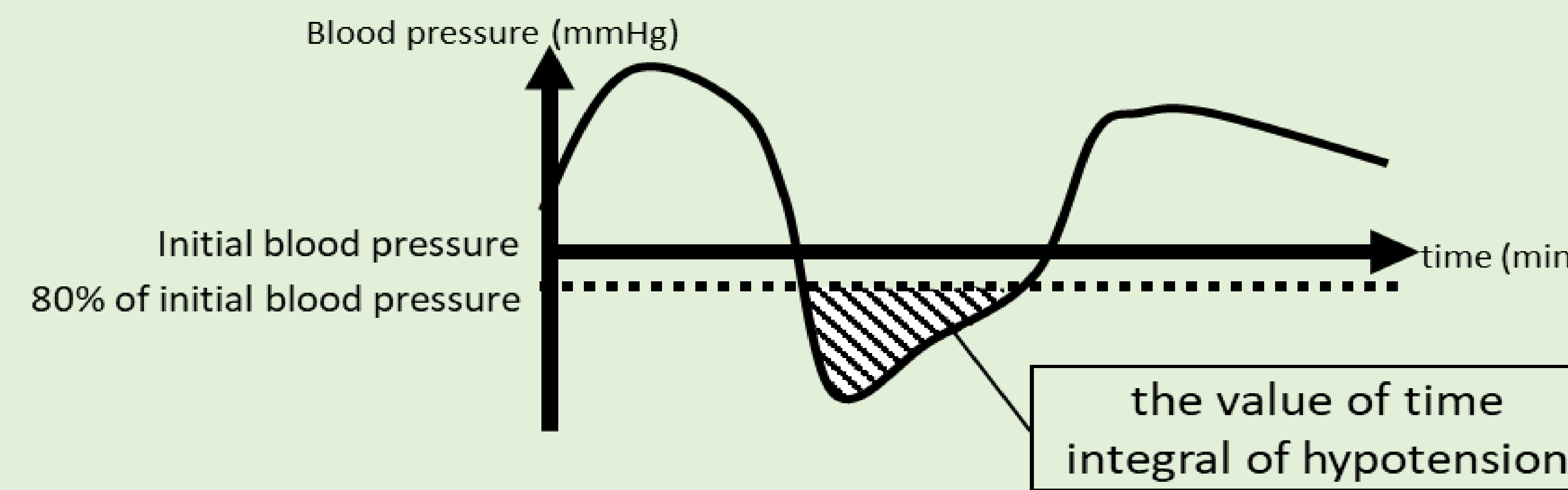
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Introduction

Hypotension induced by spinal anesthesia for caesarean delivery is very common in both healthy and complicated pregnant women. It also induces reduced placental blood flow, leading to deterioration of fetal well-being, such as Apgar score and umbilical arterial pH (UA pH). However, the effect of hypotension regarding both impact and duration on UA pH has not been well known. Thus, we evaluated the impact of hypotension as time integral in pregnant women undergoing caesarean delivery.

Methods

- Pregnant women with term baby aged ≥ 20 years who were underwent caesarean delivery performed with single shot spinal between January 2017 and March 2019 were eligible.
- Multiple pregnancies, cases which were converted to general anesthesia, and cases requiring multiple administration of spinal anesthesia were excluded.
- The outcome of this study was to predict UA pH focused on the value of time integral of hypotension.
- Maternal hypotension was defined as a decrease in systolic arterial pressure (SAP) and mean arterial pressure (MAP) to $< 80\%$ of baseline value defined as initial blood pressure in the operating room.
- Patient demographics and intraoperative data were evaluated.



Baseline characteristics and intraoperative data of patients		Mean(standard deviation) or number(%) (n=381)
variable		
Age(y)		33.8(4.8)
Body Mass Index(kg/m ²)		26.7(5.1)
Gestational day(days)		266(8.8)
Hypertensive disorder of pregnancy		27(7.1)
Smoking status during pregnancy	none	292(76.7)
	passive smoking	65(17.1)
	current smoking	24(6.2)
Diabetes mellitus	none	331(86.8)
	type 1 diabetes mellitus	14(3.7)
	gestational diabetes mellitus	36(9.4)
Thyroid function	normal	355(93.1)
	hyperthyroidism	8(2.1)
	hypothyroidism	18(4.7)
Emergency surgery		143(37.5)
Dose of ephedrine until delivery (mg)		2.5(4.1)
Dose of phenylephrine until delivery (mg)		0.16(0.18)
Oxygen administration until delivery		46(12.1)
Umbilical arterial pH		7.28(0.44)
Apgar score at 1 minute		8.5(1.1)
Apgar score at 5 minute		9.6(0.8)
Birth weight(g)		2976(458)

Result of multiple regression analysis including the SAP to $< 80\%$ of the initial value.

	Regression coefficient (β)	Standard error	95%Confidential Interval (lower limit, upper limit)	P-value
Emergency surgery	-0.015	0.005	-0.026, -0.004	0.006
Dose of ephedrine until delivery (mg)	-0.002	0.001	-0.03, -0.01	0.001
The value of time integral of hypotension	0.00001	< 0.001	< 0.000 , < 0.000	0.029

Result of multiple regression analysis including the MAP to $< 80\%$ of the initial value.

	Regression coefficient (β)	Standard error	95%Confidential Interval (lower limit, upper limit)	P-value
Emergency surgery	-0.015	0.005	-0.026, -0.004	0.006
Dose of ephedrine until delivery (mg)	-0.002	0.001	-0.03, -0.01	0.001
The value of time integral of hypotension	0.00003	< 0.001	< 0.000 , < 0.000	0.047

emergency case, HDP, total dose of ephedrine and the large value of time integral of hypotension were predictive factors for UA pH.

In order to minimize the risk of fetal acidosis, excessive hypotension should be avoided and the time between the anesthetic induction and delivery should be shortened.