

Tachypnoea as a Marker for Severity of Postpartum Haemorrhage

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OBJECTIVE

Postpartum haemorrhage (PPH) is a leading cause of maternal mortality. Adverse outcomes are frequently associated with delayed recognition. Respiratory rate has been utilised in other areas of medicine as an early marker of shock, but there has been limited research in the obstetric field. This study aimed to determine the utility of respiratory rate as a predictor of the severity and outcomes of PPH.

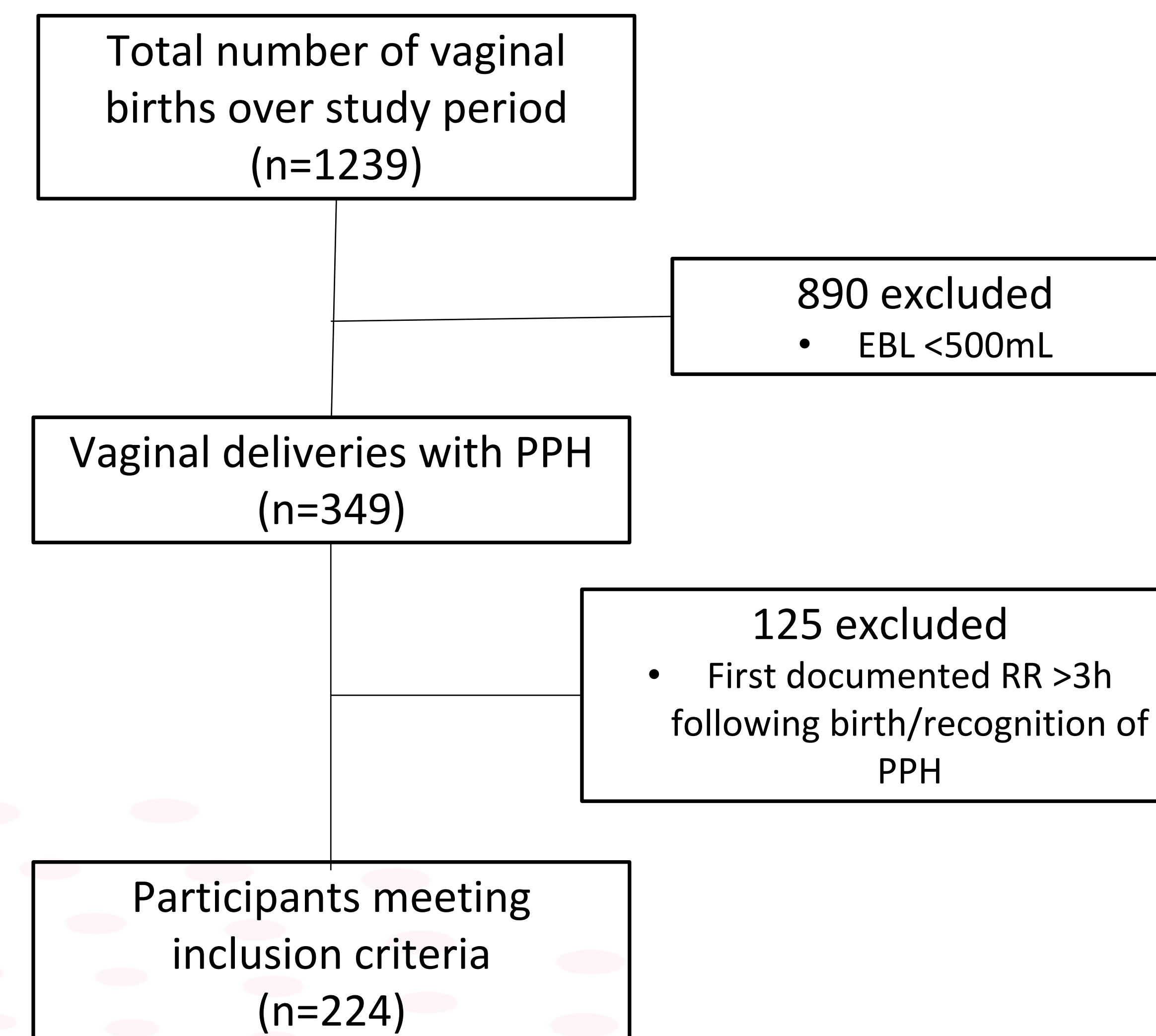


DESIGN

This prospective cohort study was conducted in a major tertiary maternity hospital in Victoria, Australia.

METHODS

This study looked at all cases of PPH following vaginal delivery over a three-month period. PPH was defined as an estimated blood loss greater than 500ml recorded by midwifery and medical staff. Prior to the study period, a midwifery education program was carried out to encourage accurate measurement of respiratory rate. Data regarding patient demographics, delivery and vital signs were obtained from the electronic medical record. Cases were excluded if respiratory rate was not recorded.



RESULTS

There were 349 cases of PPH during the study period. 224 (64.2%) met inclusion criteria.

123 (54.9%) had a normal vaginal delivery, 67 (29.9%) had a forceps delivery, and 34 (15.2%) had a vacuum delivery. The mean estimated blood loss was 936mL (SD 453mL).

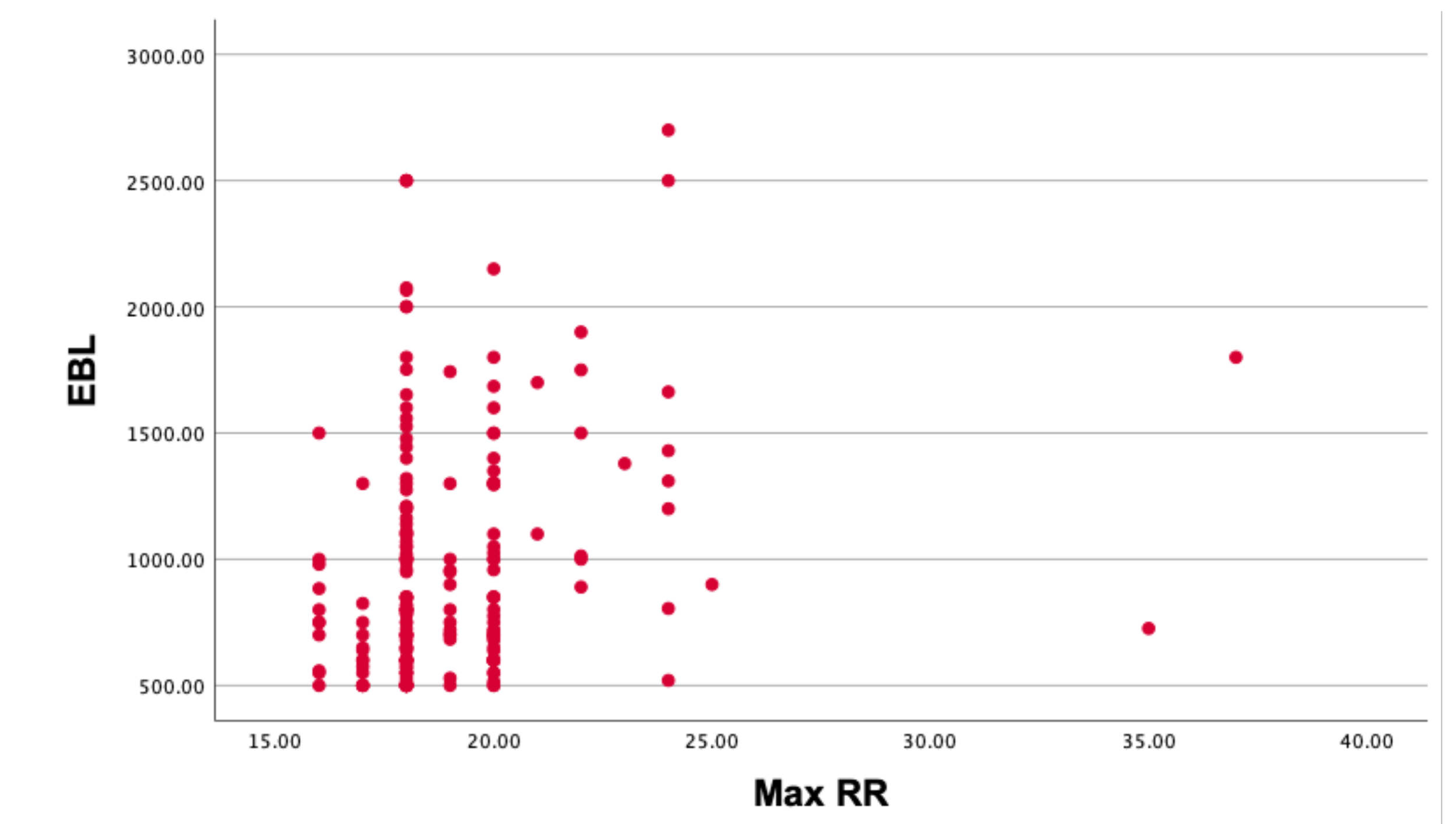
- Increased respiratory rate was associated with significantly larger PPH, higher max heart rate and need for ICU admission ($p<0.001$).
- Women who had larger PPHs were found to have lower systolic blood pressures, higher shock indexes, and greater possibility of requiring blood transfusion and ICU admission ($p<0.001$).
- Respiratory rate over 20 had a specificity of 90.6% for estimated blood loss over 1500ml ($p=0.024$)
- Respiratory rate over 22 had a specificity of 89.9% for estimated blood loss over 1500ml ($p=0.004$).

Demographic Characteristics (Mean, SD)

Age	32.7 (4.4)
BMI	24.8 (5.3)
Gestation	39.4 (2.7)
Delivery Characteristics	
Nulliparous	149 (66.5%)
Twin delivery	5 (2.2%)
Previous CS	12 (5.4%)
Artificial reproduction	14 (6.3%)
PET	13 (5.8%)
GDM	28 (12.5%)

Delivery Outcomes

Labour Type	Spontaneous	86 (38.4%)
	Augmented	47 (21.0%)
Method of Birth	Induced	91 (40.6%)
	NVD	123 (54.9%)
	Forceps	67 (29.9%)
	Vacuum	34 (15.2%)
Episiotomy OT		120 (53.6%)
		76 (33.9%)



Max RR	Coefficient (95% CI)	P value
EBL	50.97 (26.09-75.85)	<0.001
Max HR	2.41 (1.117-3.711)	<0.001
Lowest systolic BP	-0.025 (-0.745-0.696)	0.946
Shock index	0.109 (-0.022-0.237)	0.103
ICU admission	0.017 (0.008-0.027)	<0.001
Blood transfusion	0.020 (0.003-0.038)	0.025

CONCLUSION

Tachypnoea is associated with obstetric shock in the setting of PPH and may serve as an important early clinical marker.

Almost one third of patients in our cohort with PPH did not have accurate respiratory rate recorded. Our findings suggest that greater emphasis on the importance of tachypnoea may improve early detection and subsequent management of PPH.

