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Original Research – Quantitative

Relationship between duration of second stage of labour and postpartum anaemia

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ABSTRACT

Aim: To assess the relationship between the duration of the second stage of labour and postpartum anaemia during vaginal birth.
Methods: An observational, analytical retrospective cohort study was performed at the "Mancha-Centro Hospital" (Spain) during the 2013–2016 period. Data were collected from 3437 women who had a vaginal birth. Postpartum anaemia was defined as a haemoglobin level below 11 g/dL at 24 h postpartum. A univariate analysis was used for potential risk factors and a multivariate analysis with binary logistic regression to control for possible confounding factors.
Findings: The incidence of postpartum anaemia was 42.0%. The risk of postpartum anaemia did not increase in nulliparous women whose duration of the second stage of labour exceeded 4 h. Compared with multiparous women who delivered between 0 and 3 h, multiparous women with a duration of the second stage of labour beyond 3 h were at higher risk of postpartum anaemia (OR = 2.43 [1.30–4.52]).
Conclusion: The duration of the second stage of labour beyond 4 h is safe for postpartum anaemia in nulliparous women. However in multiparous women, monitoring should increase if the second stage of labour exceeds 3 h given the increased risk of postpartum anaemia.

Statement of significance

Problem or issue

The relationship between duration of the second stage of labour and postpartum anaemia has not been studied.

What is already known?

Postpartum anaemia is an important public health problem. Postpartum haemorrhage is the main cause of postpartum anaemia. Most studies show that a prolonged second stage increases the risk of postpartum haemorrhage, but the ideal duration of the second stage is not clearly defined, and the relationship between the duration of the second stage and postpartum anaemia is not known.

What this paper adds?

A prolonged second stage increases the risk of postpartum anaemia in multiparous women, but not in nulliparous women.

1. Introduction

Postpartum anaemia (PA) is a serious public health problem given its prevalence, its effects on maternal health and its socio-economic impact.[1] A women is considered to present PA if she has postpartum Hb levels of <11 g/dL during postpartum week 1, whose prevalence is estimated to fluctuate at around 50% in

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European females.[2] In developing countries, the prevalence of PA is higher than in developed Western countries, and ranges between 50% and 80%.[2] This diversity in the prevalence of PA might be due to the time when postpartum Hb levels are analysed, the diversity of the studied populations or the socio-economic conditions of the countries under study.[3]

Postpartum anaemia is a major health problem in women of reproductive age[2] as it is associated with worse quality of life, reduced cognitive capacities (alterations in memory and concentration), emotional instability and postpartum depression.[2] Moreover, reduced occupational capacity or diminished immune function[4,5] have even been related with the presence of alterations in the mother–child relationship, which can imply alterations during the child's psychoneurological development.[6]

The main causes of PA are anaemia during pregnancy or prepartum anaemia and acute haemorrhagic anaemia from loss of blood while giving birth (postpartum haemorrhage PPH).[2] Among the main causes of postpartum haemorrhage PPH we find: uterine atony, tissue retentions, lesions in the birth canal and altered coagulation.[7] Uterine atony is responsible for 80% of postpartum haemorrhage[8,9] and, like all other factors, predicting and anticipating it are extremely difficult. Many factors are associated with postpartum atony appearing (overdistended uterus, intra-amniotic infection, use of uterine relaxants, distended bladder, functionally or anatomically deformed uterus).[10] However, one of the most feasible hypotheses is muscle exhaustion during extremely long births and the subsequent loss of uterine contractile capacity.[10] Knowing the role of an excessive duration

Table 1
Univariate analysis for postpartum anaemia in nulliparous and multiparous women.

	Nulliparous women			Multiparous women		
Variables	No anaemia n (%)	Postpartum anaemia n(%)	p-Value	No anaemia n (%)	Postpartum anaemia n (%)	p-Value
Maternal age (years)			0.015			0.564
≤35	556 (47.7)	610 (52.3)		807 (67.1)	396 (32.9)	
>35	54 (37.0)	92 (63.0)		350 (65.7)	183 (34.3)	
Labour induction			0.153			0.841
Yes	177 (49.7)	179 (50.3)		237 (66.2)	121 (33.8)	
No	433 (45.3)	523 (54.7)		920 (66.8)	458 (33.2)	
Active management of third stage			<0.001			<0.001
Yes	326 (52.7)	293 (47.3)		613 (71.7)	242 (28.3)	
No	284 (41.0)	409 (59.0)		544 (61.7)	337 (38.3)	
Manual removal of the placenta			0.189			0.851
Yes	6 (31.6)	13 (68.4)		9 (64.3)	5 (35.7)	
No	604 (46.7)	689 (53.3)		1148 (66.7)	574 (33.3)	
Episiotomy			<0.001			<0.001
Yes	283 (39.3)	438 (60.7)		178 (54.3)	150 (45.7)	
No	327 (55.3)	264 (44.7)		979 (69.5)	429 (30.5)	
Degree of perineal tear			0.276			0.001
No tear	491 (47.4)	544 (52.6)		896 (68.9)	405 (31.1)	
First or second degree	115 (43.6)	149 (56.4)		258 (60.6)	168 (39.4)	
Third or fourth degree	4 (30.8)	9 (69.2)		3 (33.3)	6 (66.7)	
Previous caesarean section						<0.001
Yes	Not valuable			76 (45.8)	90 (54.2)	
No				1081 (68.9)	489 (31.1)	
Epidural analgesia			<0.001			0.019
Yes	544 (44.9)	688 (55.1)		886 (65.2)	472 (34.8)	
No	66 (66.0)	34 (34.0)		271 (71.7)	107 (28.3)	
Neonatal birth weight (g)			0.139			0.033
≤2500 g	42 (56.0)	33 (44.0)		41 (68.3)	19 (31.7)	
2500–3999 g	557 (46.1)	650 (53.9)		1057 (67.4)	512 (32.6)	
≥4000 g	11 (37.7)	19 (63.3)		59 (55.1)	48 (44.9)	
Gestational age (weeks)			0.005			0.885
<37	38 (60.3)	25 (39.7)		41 (69.5)	18 (30.5)	
37–41	517 (47.0)	582 (53.0)		990 (66.5)	499 (33.5)	
>41	55 (36.7)	95 (63.3)		126 (67.0)	62 (33.0)	
Duration first stage of labour			<0.001			0.002
Until 3 h	214 (53.3)	166 (43.7)		679 (70.1)	290 (29.9)	
>3–6 h	245 (44.5)	305 (55.5)		365 (63.6)	209 (36.4)	
>6–9 h	102 (39.5)	156 (60.5)		88 (60.7)	57 (39.3)	
>9 h	49 (39.5)	75 (60.5)		25 (52.1)	23 (47.9)	
Duration second stage of labour			0.003			<0.001
Until 1 h	256 (53.0)	227 (47.0)		905 (69.8)	391 (30.2)	
>1–2 h	174 (44.1)	221 (55.9)		149 (57.3)	111 (42.7)	
>2–3 h	106 (44.2)	134 (55.8)		83 (61.9)	51 (38.1)	
>3–4 h	65 (39.9)	98 (60.1)		20 (43.5)	26 (56.5)	
>4 h	9 (29.0)	22 (71.0)				

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