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Original Research–Quantitative

# Incidence of postpartum anaemia and risk factors associated with vaginal birth

Ana Rubio-Álvarez<sup>a,\*</sup>, Milagros Molina-Alarcón<sup>b</sup>, Antonio Hernández-Martínez<sup>a</sup>

<sup>a</sup> Hospital “Mancha-Centro”, Alcázar de San Juan, Spain

<sup>b</sup> University of Castilla-La Mancha, Albacete, Spain

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### ABSTRACT

**Background:** Postpartum anaemia is a frequent and potentially preventable complication that has serious repercussions on health and maternal well-being.

**Aim:** Determine the incidence and perinatal risk factors associated with postpartum anaemia in women who gave birth vaginally.

**Methods:** An observational and analytical retrospective cohort study conducted at the Mancha-Centro Hospital during the 2010–2014 period. Data were collected from 2990 women who gave birth vaginally. The main outcome variable was postpartum anaemia for two cut-off points (haemoglobin (Hb) <11 g/dL and <9 g/dL at 24-h postpartum). Women with prepartum anaemia (<11 g/dL) were excluded. It included a multivariate analysis by multiple linear regression.

**Findings:** 45% (1341) of women had postpartum levels of Hb <11 g/dL, and 7.1% (212) of women had Hb <9 g/dL. The most strongly associated risk factors with more severe anaemia (Hb <9 g/dL) were episiotomy (OR 3.19. 95%CI: 2.10–4.84), first stage of labour >9 h (OR 2.50. 95%CI: 1.58–3.94), primiparity (OR 2.50. 95%CI: 1.61–3.87) and previous caesarean section (OR 2.43. 95%CI: 1.51–3.90). The other independent risk factors for both Hb cut-off points were prolonged second stage of labour, instrumental birth, tearing > first degree, non-practice of active management and heavier birth weight of newborns.

**Conclusion:** Postpartum anaemia has a high incidence. The active management of third stage of labour, selective practice of episiotomies, and performing instrumental births only when strictly necessary are efficient measures to lower the incidence of postpartum anaemia.

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Statement of significance

#### Problem or issue

Anaemia is influenced by several intrapartum factors and very little is known about them in vaginal birth.

#### What is already known

Anaemia is a worldwide problem with high incidence that requires preventive measures due to women's altered quality of life.

#### What this paper adds

Risk factors associated with two different cut-off points of anaemia (Hb <11 g/dL and Hb <9 g/dL)

### 1. Introduction

Postpartum anaemia is a major public health problem with a high incidence worldwide. It is estimated that 50–80% of women present anaemia within 48 h of giving birth.<sup>1</sup> Repercussions are more serious in low-income countries for its association with other morbid processes, where it is also one of the main causes of maternal mortality.<sup>2</sup>

The World Health Organization (WHO) adopted the haemoglobin (Hb) level of <12 g/dL as a criterion to define postpartum anaemia in non-pregnant women.<sup>3</sup> However, it is difficult to find a uniformly accepted definition as other authors have later opted for

\* Corresponding author at: C/ Agen, no 7, 2B, Toledo, 45005, Spain.

E-mail address: [aralvarez@torrejonosalud.com](mailto:aralvarez@torrejonosalud.com) (A. Rubio-Álvarez).

more restrictive criteria by selecting an Hb cut-off point at Hb <11 g/dL,<sup>4</sup> and even one of <10 g/dL.<sup>5,6</sup>

The level of Hb is expected to increase in the first week postpartum as the physiological haemodilution characteristic of pregnancy disappears and, hence, the body's iron reserves become more available.<sup>7</sup> However, anaemia has been observed as a much commoner problem than expected because postpartum Hb levels

are influenced mainly by two circumstances: gestational anaemia and the magnitude of peripartum blood loss,<sup>1</sup> where haemorrhage is the most frequently associated cause of puerperal anaemia.<sup>8,9</sup> It is estimated that up to 6% of births are complicated by loss of blood >500 ml,<sup>10</sup> with identifiable risk factors only in 25% of cases.<sup>11</sup> For this reason, prevention programmes have been set up, based on administering uterotonic drugs in the third stage of labour given

**Table 1**  
Univariate analysis for postpartum anaemia < 11 g/dL.

Variables	No anaemia (n%)	Anaemia (n%)	p-Value
Parity			<0.001
Primiparous	652 (42.6)	880 (57.4)	
Multiparous	991 (68.0)	467 (32.0)	
Maternal age (years)			0.178
≤35	1259 (54.3)	1060 (45.7)	
>35	384 (57.2)	287 (42.8)	
Multiple pregnancy			0.192
Yes	3 (33.3)	6 (66.7)	
No	1640 (55.0)	1341 (45.0)	
Gestational age (weeks)			0.001
<37	78 (67.2)	18 (32.8)	
37–40+6	1394 (55.4)	1122 (44.6)	
≥41	171 (47.8)	187 (52.2)	
Labour induction			0.345
Yes	389 (53.4)	339 (46.6)	
No	1254 (55.4)	1008 (44.6)	
Previous caesarean section			<0.001
Yes	71 (40.6)	104 (59.4)	
No	1572 (55.8)	1243 (44.2)	
Duration first stage of labour (hours)			<0.001
<3	805 (64.8)	438 (35.2)	
3–6	583 (51.3)	554 (48.7)	
6–9	177 (42.2)	242 (57.8)	
>9	78 (40.8)	113 (59.2)	
Duration second stage of labour (hours)			<0.001
<1	1039 (63.9)	587 (36.1)	
1–2	315 (48.0)	341 (52.0)	
>2–3	187 (45.2)	227 (54.8)	
≥3	102 (34.7)	192 (65.3)	
Type of birth			<0.001
Natural birth	1581 (58.1)	1141 (41.9)	
Instrumental birth	62 (23.1)	206 (76.9)	
Birth weight (g)			<0.001
<3000	543 (63.3)	315 (36.7)	
3000–3499	681 (53.0)	603 (47.0)	
≥3500	419 (49.4)	429 (50.6)	
Active management of third stage of labour			<0.001
Yes	831 (61.6)	519 (38.4)	
No	812 (49.5)	828 (50.5)	
Manual removal of the placenta			0.004
Yes	10 (30.3)	23 (69.7)	
No	1633 (55.2)	1324 (44.8)	
Episiotomy			<0.001
Yes	466 (39.4)	718 (60.6)	
No	1177 (65.2)	629 (34.8)	
Degree of perineal trauma			0.081
Intact perineum or first degree tear	1286 (55.8)	1018 (55.0)	
Second, third or fourth degree tear	357 (52.0)	329 (48.0)	
Foetus' life status			0.287
Life foetus	1641 (55.0)	1343 (45.0)	
Antenatal foetus demise	2 (33.3)	4 (66.7)	

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